FMFM 1-3

BASIC MARKSMANSHIP

U.S. MARINE CORPS

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DEPARTMENT OF THE NAVY
HEADQUARTERS UNITED STATES MARINE CORPS
WASHINGTON, D.C. 20380

26 November 1979

FOREWORD

1. PURPOSE

FMFM 1-3, Basic Marksmanship, sets forth techniques and procedures designed to develop superior marksmanship skills as well as the confidence and motivation to use these skills in combat.

2. SCOPE

This manual covers the basic principles of marksmanship and their application on the known-distance and field ranges. Also discussed are range operations and safety procedures.

3. SUPERSESSION

FMFM 1-3, Basic Rifle Marksmanship, dated 31 January 1972.

4. CHANGES

Recommendations for improving this manual are invited from commands as well as directly from individuals. The attached User Suggestion Form should be utilized by individuals and forwarded to the Commanding General, Marine Corps Development and Education Command (Code D 036), Quantico, Virginia 22134.

5. CERTIFICATION

Reviewed and approved this date.

BY DIRECTION OF THE COMMANDANT OF THE MARINE CORPS

J. H. Miller

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DISTRIBUTION: TAC

USER SUGGESTION FORM

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To: Commanding General, MCDEC (Code D 036), Quantico, Virginia 22134

Subj: FMFM 1-3, Basic Marksmanship; recommendation concerning

1. In accordance with the Foreword to FMFM 1-3, which invites individuals to submit suggestions concerning this FMFM directly to the above addressee, the following unclassified recommendation is forwarded:

Page	Article/Par. No.	Line No.	Fig./Table No.

Nature of Change:

☐ Add ☐ Delete ☐ Change ☐ Correct

1. Proposed New Verbatim Text: (Verbatim, double spaced; continue on additional pages as necessary.)

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BASIC MARKSMANSHIP

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CHAPTER 1

INTRODUCTION

Section I. GENERAL

1101. MARINE RIFLEMAN

a. Role.--The Marine rifleman of the next conflict will be, as he has been in the past, among the first to confront the enemy and the last to hang his weapon in the rack after the war is won. This has been just as true for global wars such as World War II as it has been for "limited wars" such as the Korean and Vietnam conflicts. The ultimate objective of any conflict is control of the ground and the people on it. This objective cannot be attained without the rifleman; it is he who dislodges the enemy, occupies the ground, and controls the people. Armed conflicts will continue to be fought in various parts of the world in the foreseeable future, and it can be assumed that the Marine Corps will be involved in some as

in the past. The role of the Marine rifleman is to assist his squad in accomplishing its mission. This is to locate, close with, and destroy the enemy by fire and maneuver, or repel his assault by fire and close combat in the amphibious assault and subsequent operations ashore. The rifle is the primary means with which the Marine accomplishes this mission. It is, therefore, imperative that he have a detailed knowledge of and professional ability with the rifle. The role of the rifleman will not be obviated by the threat of nuclear war.

b. State of Training.--World War II, the Korean conflict, and the Vietnam conflict have proven that the success or failure of the rifle squad, platoon, or company to take an objective depends upon the state of training of the riflemen in these units. To be "combat ready" the Marine must be skilled in tactics and must be highly proficient in the use of his rifle. Although equipped with the best rifle in the world, a unit with poorly-trained riflemen cannot be depended upon to accomplish its mission. A poorly-trained rifleman lacks confidence. Usually, he either fails to fire his weapon, or he fires ineffectively in the general direction of the enemy. To send Marines into battle without thorough preparatory training in the use of their arms is to expose them to death uselessly. On the other hand, a well-trained rifleman has confidence and usually can deliver accurate fire under the most adverse battle conditions. It is the latter who gets hits and kills the enemy. When engaging an enemy with a numerical advantage who has an excellent knowledge of tactics, superior firepower is necessary to defeat him. Superior firepower can only be accomplished by

riflemen highly skilled in the use of their weapons. Teaching them this skill is a challenge all marksmanship instructors must not forget.

1102. EVOLUTION OF THE RIFLE

a. Muzzle-Loading Rifles.--In the early days of the rifle, black powder and lead balls were used by every nation. Besides being smokey and dirty, black powder was very inefficient compared with modern propellants due to its lower energy content per cubic centimeter. When these rifles were fired, a cloud of white smoke was expelled disclosing the position of the rifleman. Also, a thick sooty residue was deposited in the bore of the rifle which became progressively thicker unless the bores were washed after each shot. As the residue grew thicker, the diameter of the bore grew smaller making the rifle increasingly more difficult to load as well as diminishing the accuracy of the shot. The inefficient use of black powder and early bullets led rifle makers to build weapons with longer barrels and larger bores than the rifles of today. The combination of a longer barrel for higher velocity and larger bore for a heavier bullet was necessary to give the desired killing effect. Muzzle-loading rifles fired two types of projectiles: the lead ball and conical (elongated) bullet.

(1) Lead Ball Bullet.--Because a sphere is poorly shaped for fast travel, the lead ball lost speed rapidly after being fired. Although some of the early rifles fired lead balls at a muzzle speed of as high as 2,000 feet per second, the velocity would decrease to

approximately 1,500 feet per second at a distance of 100 meters. Present day rifles firing projectiles at an initial velocity of approximately 2,800 feet per second lose only some 300 feet per second in the first 100 meters. Lead balls were often "patched" (i.e., greased linen, flannel, or thin soft leather was wrapped or tied over the ball) which served as a lubricant to ease loading, reduced escaping gas, and prevented the ball from losing lead onto the bore while traveling through it. When the lead ball was used bare, the bore picked up a lead coating which grew progressively thicker decreasing the accuracy of each succeeding shot. In addition, the effort to ram a lead ball down 32 or more inches of reduced diameter bore was exhausting and, sometimes, all but impossible.

(2) Conical Bullet.--In time, the round bullet gave way to the conical bullet. It had been discovered as early as the late 1700's that elongated missiles were more efficient in flight and traveled to a much greater maximum range. Massed squad and platoon fire with conical bullet rifles were effective at ranges of 1,000 meters or more. Several years prior to the Civil War, the conical bullet was adopted for rifles almost worldwide because it was faster to load, more accurate, and longer in range than the lead ball bullet.

b. Breech-Loading Rifles.--With the advent of breech-loading rifles, a big step was taken in the development of the rifles and ammunition of modern times. Although there were variations, the early breech-loading rifles were generally lever action and then bolt action.

(1) Lever-Action.--The early Sharps rifle was one of the first of the breech-loading, lever-action rifles. Because it had a paper cartridge rather than the metal cartridge case used in modern rifles, a portion of the gas generated by the powder flashed out at the juncture of the breech-block and receiver after firing. By 1870, most armies had adopted breech-loading, single shot, lever-action rifles which usually fired fixed, metallic black powder, lead bullet cartridges of .40 to .45 caliber. These improved firearms could be fired at least 15 times a minute by a trained rifleman. Lever-action repeating rifles had been developed to a useful level by 1861, but due to design, had to be held to lesser powder levels than was desired for infantry use. The Spencer and the Henry lever-action rifles were used in the Civil War by many military units. The Spencer carried seven cartridges and the Henry 16. Each weapon had an effective range of approximately 225 meters and had a rate of fire about five times greater than the standard muzzle-loader.

(2) Bolt-Action

(a) The year 1886 was a historic one in infantry rifle design. France adopted a manually operated bolt-action rifle of .32 caliber with a jacketed bullet design for use with nitrocellulose powder. The bullet was designed to prevent the lands from stripping lead and to permit it to spin in the rifling grooves; also, nitrocellulose gave off very little smoke. The ancient bondage to black powder had been dissolved, and the rifleman's position was no longer easily disclosed. By 1888, Great Britain and Germany used similar new designs; in 1892, the United States

followed suit; and by 1898, no modern army was without a smaller caliber repeating rifle of the new type. The new arms were of 5- to 10-shot capacity and ranged in caliber from .26 to .32, as compared to the older .40 to .45 caliber. Use of nitrocellulose propellants and advances in metallurgy resulted in the following improvements in weapons:

1 Reduction in bullet diameter without a reduction in shocking power.

2 Increased accuracy and penetration.

3 Flattening of trajectory by at least 50 percent, thus extending the limit of grazing fire.

4 Decreased weight of rifle cartridges by as much as 40 percent.

5 Reduction of smoke given off to a negligible amount.

(b) The Springfield 1903 rifle reflected the era of high development in rifles operated manually, and ended in 1936 with the introduction of a rifle of the Garand design into U.S. service.

c. M1 Rifle.--The Garand design, designated M1, was the first of the successful gas-operated rifles of full infantry power, and it outgunned enemy rifles in Europe and the Pacific in the ratio of 3 to 1. It was rugged, dependable, powerful, and accurate. The tiring bolt manipulation by the rifleman was a thing of the past. The M1 rifle ushered in an era that saw foreign nations scrambling for semiautomatic designs in individual infantry weapons. Britain and France discarded their old, time-proven, bolt action rifles and adopted the Belgian FN design. Soviet Russia developed as her now

standard infantry weapon, a rifle-powered submachinegun of 30-shot capacity (the AK). The United States, exploiting the potential of John C. Garand's M1, has modernized it as the M14 for increased cartridge capacity (20 shots instead of 8) and quick and simple adaptation to the automatic rifle role.

d. M14 Rifle.--In March 1960, the Marine Corps announced the adoption of the M14 rifle. It was equipped with a light barrel and was designed primarily to replace the M1 rifle in a semiautomatic fire role. It could be converted to automatic fire by merely replacing the selector lock with a selector lever. The M14 weighed approximately 11 1/2 pounds with full magazine and cleaning equipment. A bipod added an additional 1 3/4 pounds when the M14 was used in the automatic rifle role. The M14 is basically the same in design as the M1 rifle. Most changes made were to accommodate the shorter 7.62mm cartridge and to allow for the use of a magazine instead of a clip for holding ammunition. Consequently, the receiver, bolt, and firing pin were shorter, and the floor plate of the firing mechanism was cut away to allow for the magazine. The most significant advantage of the M14 design was that it offered an increase of 12 rounds in magazine capacity over the M1 rifle with NO INCREASE IN WEIGHT. The most significant advantage of the M14 with bipod (in the automatic rifle role) was that it offered the same magazine capacity as the Browning automatic rifle (BAR) with a DECREASE IN WEIGHT. The weight saved by the M14 with bipod was about 10 pounds. The 7.62mm cartridge was approximately 1/2 inch shorter than the .30 caliber M2 cartridge and 12

percent lighter. New developments in powder permit the use of less powder in a shorter case without sacrificing loss of velocity or increase in permissible chamber pressure.

e. <u>M16A1 Rifle</u>.--The latest rifle in use by U.S. forces is the M16A1 rifle which was accepted by the Marine Corps for operational use by certain units in Southeast Asia in 1966. In September 1975, the Marine Corps adopted the M16A1 rifle as the basic weapon to replace the M14. The M16A1 is a 5.56mm magazine fed, gas operated, air-cooled shoulder weapon. It is designed for either semiautomatic or full automatic fire through use of a selector lever. It accommodates either a 20-round or 30-round magazine. The M16A1 uses ball and tracer ammunition and has a muzzle velocity of 3,250 feet per second with a maximum effective range of 460 meters. It has an easily detachable clothespin-type bipod. Advantages of the weapon over the M14 are: less recoil; versatility, in that all persons so armed have a full automatic fire capability; and the very significant lighter weight. The M16A1 weighs only 7.6 pounds fully loaded (20-round magazine and sling) as compared to 11.5 pounds for the M14. A full 20-round M16A1 magazine weighs .7 pounds while a full 20-round M14 magazine weighs 1.5 pounds. For data on the 30-round magazine, see chapter 3.

1103. RELATIONSHIP OF INDIVIDUAL WEAPON DESIGN TO COMBAT USE

To fully understand rifle marksmanship and rifle marksmanship training, it is necessary to know something about rifles, their characteristics, and combat usefulness. The rifle is the

primary individual weapon for all armies because it is the most versatile and effective weapon which can be carried and used in combat.

a. Design Considerations.--The rifleman's weapon must be so designed that it can be held with steadiness while accurate fire is directed with sufficient power to kill the enemy as far away as marksmanship skill and the precision of the weapon will allow. Man's scientific level today is such that it still takes the relatively long steel barrel and wooden or plastic stock of a rifle to obtain the desired performance. It takes a certain quantity of today's rifle powder to move a rifle bullet at a speed sufficient to attain the desired effect on the appropriate target. The design of the firearms depends on the sciences of metallurgy, chemistry, and ballistics as well as the related field of human mechanics.

(1) Metallurgy.--Metallurgy has a large share in determining the weight and bulk of a rifle. It also largely determines the effect of a fired round on the barrel of the rifle and on the object at which it is fired.

(2) Chemistry.--The chemistry of the propellant heavily dictates the ballistic qualities of the rifle.

(3) Ballistics.--Ballistics fuses together the knowledge of metallugry and chemistry, and adds physics to design a cartridge and projectile that will satisfy combat requirements.

(4) Human Mechanics.--Human mechanics evaluate man's anatomy to deduce the best systems of weapon configuration. Many minute details are considered when designing a rifle, such as length of rifle stock, distance between

handgrip (pistol grip of a rifle) surface and pressure surface of the trigger, and charging handles.

b. Essential Qualities of the Rifle.--On the battlefield, Marines live by the complex package called a "rifle." If the design is well done, the rifle will fit the average man very well and will deliver accurate and deadly fire on targets. The Marine's basic weapon must have the qualities desired in a modern combat rifle. These essential qualities are:

(1) Accuracy.--We are now in an era of "Emphasis on Accuracy." The vast numbers of our potential enemies clearly point out the fact that accurate rifle fire is the key to success. A rifleman who merely "sprays" shots in the vicinity of the enemy produces little effect. Against an unseasoned enemy, such fire may be temporarily effective, but the result is not lasting. The mission of the rifleman is to kill the enemy. Against seasoned troops, spraying shots have little effect. Someone once gave what is perhaps the best definition of firepower when he said that, "Firepower is bullets hitting people!"

(2) Flatness of Trajectory.--A high muzzle velocity is desired to prevent the projectile from falling much below the line of sight over the usable range. When projectiles do not "drop" much below the extended line of the bore over combat ranges, it is relatively easy to make hits with them.

(3) Moderate Recoil.--Moderate recoil means that the muzzle climb in firing is moderate, which enables a fast recovery between

shots. This is very important in rapid fire in combat against a large enemy force.

(4) Powerful.--The U.S. military rifle must be powerful; that is, it must be able to kill an enemy soldier as far away as the rifleman can hit him. It must easily penetrate enemy helmets and body armor up to the same range.

(5) Simplicity of Operation.--The combat rifle must be extremely simple in design, enabling quick mastery even by those with little or no previous knowledge of firearms.

(6) Reliability.--Exhaustive tests by ordnance personnel must confirm the reliability of working mechanisms of the Marine's basic weapon.

(7) Lightness of Rifle and Ammunition.--Lightness of rifle and ammunition is a highly controversial issue. It must be remembered that the required ruggedness of a military weapon is not found in a 6-pound commercial hunting rifle. The military rifle should be rugged enough to withstand the rigors of bayonet fighting. The cartridge projectile should be relatively small and light yet sufficiently heavy and large enough in diameter to deliver a killing blow at the desired maximum effective range and beyond. This means that our fighting men can now carry more ammunition than before with no increase in total weight of field load.

Section II. MARINE MARKSMANSHIP TRAINING

1201. GENERAL

a. Procedures and Techniques.--The procedures and techniques used in the Marine Corps rifle marksmanship training program are based on the concept that riflemen must be proficient marksmen capable of effectively applying their shooting skills in combat. The degree of proficiency attained by a rifleman is largely dependent upon the correct teaching and application of marksmanship fundamentals. Initially, during marksmanship training, emphasis is placed on learning, reviewing, or reinforcing the skills of shooting fundamentals. Later in the training program, emphasis is gradually focused on the combat applications of marksmanship in addition to the fundamentals. Instructors must continually be careful not to "over" instruct their particular groups of students. This manual should be regarded as a manuscript and the resulting instruction should be tailored to the level of the students. For example, in a class consisting of Marines with 5 years average experience or more, the instruction should be detailed, while instruction to recruits should cover only the necessities. The instructor can then make modifications to the instruction on an individual basis.

b. Conditions Affecting Marksmanship on the Battlefield.--Combat applications are based on conditions affecting marksmanship on the battlefield. The more common of these are:

(1) Enemy personnel are seldom visible except in the assault.

(2) Most combat targets are linear in nature and will consist of a number of men or objects irregularly spaced along covered or concealed areas such as ground folds, hedges, and borders of woods.

(3) Most combat targets can be detected by smoke, flash, dust, noise, or movement, but will only be visible for a brief moment.

(4) Combat targets can be engaged by using nearby objects as reference points.

(5) In the majority of cases, the range at which individual combat targets can be detected and effectively engaged will be less than 300 meters.

(6) The nature of the target, irregularities of terrain, and vegetation will generally require a rifleman to use a position other than prone in order to fire effectively on the target. In a defensive situation, the rifleman will usually be firing from a foxhole position or other type of defensive emplacement.

(7) Selecting a point of aim is difficult because of the low outline and obscurity of most combat targets.

(8) The conditions of rifle fire in combat rarely require or permit mechanical adjustments of the sights.

(9) The time element in engaging a combat target varies with:

(a) A single fleeting target that must be engaged within a minimum unknown time period.

(b) A number of distributed targets engaged within the time they remain available. In this case, the rifleman, at times, may elect the amount of time spent in engaging individual targets.

c. Competition.--Intramural competition between individuals and units is an effective means of motivating the individual and engendering unit pride. Properly channeled throughout the entire marksmanship program, it will not only lead to greater proficiency and higher qualification percentages during the initial phases of training, but also to better trained combat riflemen at the end of the program.

1202. OBJECTIVES

The objectives of the Marine Corps rifle marksmanship program are:

a. To develop in every Marine the confidence, will, knowledge, and skills required to deliver accurate, well-aimed fire against a combat target.

b. To cause the Marine to apply correct techniques of rifle marksmanship when functioning as an individual in a unit engaged in combat.

c. To ensure that every Marine maintains a continuing degree of proficiency in the application of the principles of marksmanship.

d. To provide a maximum number of shooters from which potential precision marksmen can be selected for further training for competition in inter-Service, civilian, national, and international competition; and in time of war, to provide an instructor base or cadre for marksmanship and sniper training.

1203. PROGRESSIVE MARKSMANSHIP TRAINING

a. General.--Any information required to enable the individual rifleman to effectively

engage a combat target must be considered essential and a part of the rifleman's training progression. Since shooting is a learned process, there are certain prerequisites that must be satisfied before a rifleman can pass from one phase of marksmanship training to another. In order to obtain maximum results on the field of battle, it is necessary that the rifleman be trained in certain fundamentals prior to engaging a combat target.

b. Basic Steps.--The fundamentals that the rifleman must learn in his progressive marksmanship training are broken down into three phases: preparatory marksmanship training, known-distance range firing, and field range firing. In order to obtain optimum results, it is necessary that these phases be taught in a continuing sequence. They are a steady progression that must be followed if the objectives of Marine marksmanship training are to be satisfied. The accomplishment of these three phases should be considered basic and necessary to teach the Marine to apply correct techniques of rifle marksmanship when functioning as an individual in a fire unit engaged in combat. The field range should not be confused with unit fire problems, nor should it be considered a replacement for supplementary individual firing courses.

(1) Preparatory Marksmanship Training.--This is training a Marine receives prior to firing a range course. It is during this initial phase that a sound foundation of good shooting principles is constructed, reviewed, or reinforced. The degree of proficiency obtained by the rifleman is dependent upon this

foundation built during the preparatory phase. It is essential that the correct firing and safety habits become so fixed that the proper method becomes the most natural method. Drilling in fundamentals and continued supervision will bring the greatest return in the shortest possible time. Proper shooting is a complex operation which, like swimming, must be learned. When practiced often and long enough, the process becomes a learned skill which will be retained. However, it is essential that every shooter periodically refamiliarize himself with the fundamentals of marksmanship regardless of his years of shooting experience. Even the experienced shooter will develop a deficiency from time to time in the application of certain fundamentals which often will be masked by perfection in other fundamentals.

(2) Known-Distance Range Firing.--It is during this phase that the shooter has the opportunity to put the fundamentals of marksmanship into actual practice. This "practical application" phase on the known-distance range serves three important purposes:

(a) To give the Marine the ability to hit a preselected spot with one shot by utilizing basic marksmanship fundamentals. These fundamentals teach him to understand the factors which cause hits and misses, and to make corrections when necessary.

(b) To build the Marine's confidence in his ability to kill with one well-aimed round.

(c) To enable the Marine to obtain a battlesight zero.

(3) Field Range Firing.--Known-distance range firing accomplishes the mission of

teaching and applying shooting fundamentals; however, there are many necessary prerequisites for engaging combat targets that are not, and should not, be taught on the known-distance range. The combat application of those fundamentals learned on the known-distance range is accomplished during this phase of progressive marksmanship training. The purposes of field firing are:

(a) To instruct the Marine in the application of basic marksmanship fundamentals for engaging a combat target.

(b) To further build the confidence of the Marine with his rifle. It is desirable that he progress immediately from known-distance firing to field range firing under the same instructors at the time of highest preparation and motivation.

(c) To emphasize the importance of obtaining a battlesight zero on the known-distance range.

1204. MARKSMANSHIP INSTRUCTOR SKILL BASE

Marine Corps marksmanship proficiency is the keystone of military effectiveness in ground combat operations. The objective of marksmanship training is to develop this proficiency to the highest practicable level in individuals and units. The marksmanship instructor is the principle means by which this objective is accomplished.

a. Instructor Assignment.--Instructors should be selected and assigned from the most highly qualified Marines available. These Marines should display a sound background

knowledge of marksmanship in general, a very high degree of proficiency in the application of the fundamentals, a motivational attitude for marksmanship training, and a competent, professional instructional ability. Commanders must be continually alert to maintain a high level of instructor expertise.

b. Instructor Training.--There are several vehicles available to the commander that may be used in progression or that can easily be tailored to the particular needs of the command. The more time and training initially invested, the higher the quality of instructor gained by the command.

(1) Intramural, Local Match Competition.--Good marksmen are the result of a dynamic marksmanship program consisting of aggressive command support, effective instruction and coaching, considerable practice time, and regular application of the principles learned. Competitive marksmanship programs within the Marine Corps provide for competition at all levels and should, in all cases, support the marksmanship training of the Marine rifleman by providing a vehicle for the commander to identify Marines who possess above-average interest and skills in marksmanship. Since motivation and skill in the subject area are key characteristics of the dedicated, productive instructor, these Marines should provide a highly qualified nucleus around which the command's marksmanship training program can be structured. Commanders should be continually alert to replace any Marine in the instructor-base that demonstrates a loss of motivation or

desire to accomplish the primary objective of the marksmanship program. Through the intramural and local match programs, Marines demonstrating interest and motivation are identified. To maintain this interest and continue the instructor's training, the program should also allow for instructors to participate in the local match program.

(2) Competition-in-Arms Program.--While the intramural and local match programs are a year-round vehicle for the commander, the competition-in-arms program is conducted only once each year, normally during the spring. This program includes several division match programs and ends in the Marine Corps Matches. (The words "division matches" always refer to those held in geographical areas rather than organizational matches.) These matches have two primary objectives:

(a) To enhance the marksmanship proficiency and combat readiness of the Marine Corps by:

1 Developing a base of Marines with high skills in rifle and pistol marksmanship to serve as marksmanship instructors, coaches, and range operation personnel.

2 Stimulating interest and desire on the part of the individual Marine for self-improvement of his skill and confidence with the rifle and pistol.

(b) To gain and maintain a Marine Corps ability to compete and win, as teams and individuals, in inter-Service and national matches and to provide competitors for United States teams in international matches. Each division match program includes four phases:

1 The first week provides instruction in basic and advanced marksmanship techniques and fundamentals, coaching techniques, range operation, and practical application.

2 The second and third weeks provide practice firing for the individual Marine to apply and improve his skill. Toward the end of the third week, he fulfills his annual requalification requirements.

3 The fourth week consists of competition in individual and team events with the rifle and pistol. At the conclusion of the competitions, the top 10 percent of the nondistinguished Marines advance to the Marine Corps Matches. Those Marines not advanced to the Marine Corps Matches return to their units and are assigned the additional MOS 8531 (marksmanship instructor). The commander then ensures that these Marines pass on their knowledge either as full or part-time instructors for his command.

(3) Instructor Training School.--Once the commander has identified those Marines posessing the required knowledge, skill, and motivation in marksmanship and provided the training to improve this knowledge, he must then ensure this knowledge can be effectively passed to all Marines. It follows then that the next phase of training would be an instructor training school.

(4) Command Benefits.--Through the active and aggressive leadership of the commander, a perpetual base of expertise is established and maintained. He easily builds a strong reputation of success through the intramural marksmanship program within the major

command. The esprit de corps of his unit is significantly raised through the individual Marine's desire to improve and demonstrate he too is one of the best. Through this progressive marksmanship program, the ultimate objective is achieved--a high state of combat readiness within the Marine Corps because of the confidence and proficiency of the Marine with his rifle.

1205. MARKSMANSHIP TRAINING INDOORS

Often, considerations for marksmanship training channelize into the requirements set forth in MCO 3574.2_. While there may be occasions when a commander will not be able to accomplish his requalification requirements, he will rarely be unable to accomplish the required marksmanship training.

a. Gallery Firing.--Basic marksmanship training can be accomplished to a satisfactory level through the use of a 50-foot indoor gallery range. Through the use of small bore rifles, caliber .22 LR, standard velocity, rimfire ammunition, and the standard gallery courses of fire, a commander can train his Marines in marksmanship. Commanders may desire to simulate the known-distance course, minus rapid fire, as a course of fire. When this is done, in conjunction with dry fire training with the M16A1, Marines throughout the Corps can maintain a high state of proficiency and readiness. Weapons procurement is covered in MCO 8373.2_. Ammunition procurement is covered in MCO P8011.4_. Range construction requirements are available from the Commandant of the Marine Corps (Code OTTI).

b. <u>Subcaliber Training</u>.--Marksmanship training can be accomplished with the M16A1 through the use of a subcaliber device. This device permits the firing of caliber .22 LR rimfire ammunition through the M16A1. The training value of this device cannot be overemphasized. A Marine can maintain his marksmanship proficiency in practicing his positions, sighting and aiming, sight manipulations, krigger control, and overall familiarity with his weapon. Through the use of an indoor gallery range, small bore target rifles and the subcaliber device for the M16A1, the commander can tailor a marksmanship program involving normal training and intraunit competitions that will reach 100 percent of his Marines. The proficiency of Marines firing marksman or below can be significantly improved in a relatively short period of time. Properly controlled and supervised evening firing can be scheduled; thus, the commander will accomplish the objective with no loss of unit productiveness.

CHAPTER 2

RANGE ORGANIZATION AND INDIVIDUAL RESPONSIBILITIES

Section I. RANGE ORGANIZATION

2101. GENERAL

The object of this chapter is to draw a parallel between the main tasks on a small range with those of a large range. The methods employed for control of personnel and operation of the range may be applied to a small 15-target "makeshift" range, as well as to a large, well-established range. In either case, the operation of a range must be effective so that a range unit can accomplish its primary mission of teaching marksmanship. Since there is no substitute for knowledge and experience in marksmanship, individuals with advanced marksmanship training and/or Marine Corps competition-in-arms experience should be selected for rifle range duty whenever possible. Besides being experienced

and proficient in marksmanship, an individual assigned teaching and/or coaching duties must be completely sold on the importance of marksmanship. Good coaching and a well-run range will invariably result in highly proficient marksmen.

Section II. INDIVIDUAL ASSIGNMENTS AND RESPONSIBILITIES

2201. GENERAL

All personnel responsible for individual marksmanship training must be thoroughly familiar with rifle range procedures, safety regulations, and local rifle range regulations. The responsibilities of those assigned duties listed in subsequent paragraphs must be met. If the number of men available is insufficient to assign one man to each billet, the responsibilities should be divided among the men available.

2202. RANGE OFFICER

a. General.--The term range officer as used in this manual is the individual in charge of a range where live ammunition is fired. The rank/rate of this individual will be in accordance with current directives. The assignment of the range officer is made by the commander who has the responsibility of the range facility and/or the commander of the firing unit.

b. Responsibility.--The range officer's responsibilities include but are not limited to the following:

(1) Assigning and supervising the following personnel to assist him in the operation of the range:

(a) One line NCO.

(b) One tower NCO.

(c) One block NCO for each 10 targets.

(d) One pit NCO.
(e) One assistant pit NCO.
(f) One police sergeant.
(g) One armorer.
(h) One coach for each two targets (minimum).
(i) One corpsman.
(j) Additional personnel as required, such as telephone talkers, runners, road guards, etc.

(2) The matters relative to the procurement of men and supplies should be arranged in detail. The need for certain supply items is equally as important as personnel.

(3) The conduct of all range operating personnel.

(4) Instruction of all range personnel.

(5) Coordination of all training details.

(6) Range discipline of all individuals undergoing instruction.

(7) Enforcement of all current safety regulations and range regulations.

(8) Proper conduct of record firing to ensure that all rules governing record firing are observed.

(9) Instruct pit and line verifying personnel on their duties. For a guideline, see appendix E.

2203. LINE NONCOMMISSIONED OFFICER

a. General.--The line noncommissioned officer assists the range officer in the performance of his duties. From the nature of his responsibility, the billet should be filled with

the most senior NCO available. There is little likelihood that the billet could be eliminated and his responsibilities divided among other men.

b. Responsibilities.--In a broad sense, the line NCO has four areas of responsibility:

(1) Details.--He assigns shooters to targets, relays, or pit details, as required. Telephone talkers, if appropriate, and score-keepers are also assigned.

(2) Supervision of Coaches.--He assigns coaches in such a manner as to serve the best interest of the range. The best coaches should be assigned flank targets while those of less experience are assigned near the center of the line under the eyes of the range officer or line NCO. Instruction of coaches is considered supervision; whereas, observation and analysis of firing records generally reveal weak points in the method of instruction and such weak points must be pointed out and corrective steps taken.

(3) Firing Line Control.--He enforces local and Marine Corps safety regulations and conduct of firing within the regulations for the course of fire.

(4) Prospective Range Personnel.--He advises the range officer of individuals who possess the motivation and expertise to become good range coaches or operating personnel.

2204. TOWER NONCOMMISSIONED OFFICER

a. General.--The tower NCO assists the line NCO in the performance of his duties. He

is the primary line public address (PA) operator and gives all line commands for record firing. From the nature of his responsibility, the billet should be filled with the next most senior NCO available. He should be capable of dealing with line problems calmly and in an orderly manner. The attitude expressed over the PA system and the smooth transitions from one phase to the next have a direct influence upon the shooters. Therefore, a calm professional and knowledgeable NCO should be selected. During practice firing, the giving of firing line commands should be divided among the line block NCO's.

b. Responsibilities.--The tower NCO has the following broad responsibilities:

(1) Assists line NCO in his duties.
(2) Announces line commands for record firing.
(3) Assists in training coaches and block NCO's.
(4) Supervises block NCO's when they are operating the line PA system.
(5) Ensures line-to-pit communications are maintained.
(6) Be alert to violations of safety procedures.

2205. BLOCK NONCOMMISSIONED OFFICERS

a. General.--One block NCO is assigned for each 10 targets. He assists the range officer and line NCO in the execution of their duties in their respective target areas.

b. Responsibilities.--He has responsibility for the following:

(1) Supervising training and enforcing regulations.

(2) Assisting coaches and shooters as required.

(3) Supervising pit services and reporting problems noted with the pit service to line NCO or range officer.

(4) Officiating on record day and making decisions on line alibis when authorized by the range officer.

2206. PIT NONCOMMISSIONED OFFICER

a. General.--A firm, conscientious NCO should be assigned this billet. The supervision of men in the pits is a serious matter. Constant attention is required to prevent operation failures and to ensure enforcement of safety and range regulations. From the nature of his responsibilities, the billet should be filled with the third most senior NCO available.

b. Responsibilities.--The pit NCO has the responsibility for the following broad areas:

(1) Enforcing safety and range regulations.

(2) Maintaining targets and pits.

(3) Maintaining supplies necessary in operation of the pits.

(4) Controlling operation of the pits.

(5) Conduct of personnel assigned to the pits.

2207. ASSISTANT PIT NONCOMMISSIONED OFFICER

a. General.--During all live firing, communications must be maintained between the pits and the line. Frequently during the performance of his primary duty, other duties require the pit NCO to break contact with the firing line. The assignment of an assistant pit NCO provides more efficient pit operations and proper control.

b. Responsibilities.--The assistant pit NCO has the following broad responsibilities:

(1) Assisting the pit NCO in the performance of his duties.
(2) Being capable of relieving the pit NCO in controlling and giving commands to the target operators.

2208. POLICE SERGEANT

a. General.--The billet of police sergeant, while not necessary in some cases, is highly desirable even on a small range. If a police sergeant is not assigned, the responsibilities must be divided among the coaches as additional duties.

b. Responsibilities.--The following are the responsibilities of the police sergeant:

(1) Policing the range (including sorting and boxing of brass).
(2) Drawing, issuing, and recovering ammunition.
(3) Maintaining the firing lines.

(4) Issuing and recovering of all rifle range equipment.

2209. ARMORER

a. General.--Regardless of the condition of firearms, the firing of live ammunition always presents the need for minor repairs. For this reason, an armorer should be available at the range.

b. Responsibilities.--The armorer is responsible for the following:

(1) Safety check of all weapons.
(2) Maintenance of all weapons.
(3) Maintenance of the tool kit, with small parts, for minor repairs on the firing line.

Section III. RANGE COACHES

2301. GENERAL

Coaching is an extremely important job. It is a highly technical job that must be done well. The most valuable man in our marksmanship training program is one who not only has attained a high standard of efficiency with the basic weapons himself, but who also is qualified to effectively transmit this knowledge and ability to others. We should strive to train the individual in marksmanship until he is consistently a good shot, and then to develop his ability to gain the qualities necessary to make him a competent coach. It is well worth the effort to train the Marine to become a successful coach, because experience has shown that such training develops leadership ability.

2302. INDIVIDUAL RESPONSIBILITIES

The primary responsibility of range coaches is to coach individuals in the effective use of the rifle. In addition, he is responsible for enforcement of safety regulations. He must maintain strict discipline on the firing line at all times and sternly insist upon rigid compliance with range regulations and the training program. See appendix D for a checklist of coaches' duties.

2303. INDIVIDUAL QUALIFICATIONS

To be a coach, a Marine must not only thoroughly understand all the steps necessary

to produce accurate shooting, but must understand coaching techniques and have certain other qualifications. These individual qualifications are discussed below:

a. Knowledge.--The primary qualification for an efficient coach is not only a thorough knowledge of the rifle and proficiency in its use, but a complete understanding of the instructions contained in MCO 3574.2_, which pertains to requalification shooting. This will help him set up a training program for the week of instruction and dry firing prior to the week of firing. He must be prepared to answer accurately any questions on the subject of marksmanship with which he may be confronted. Then he must develop his ability to observe the actions of the student quickly and accurately and to correct them with sound recommendations.

b. Patience.--The coach will encounter many types of individuals to try his patience: dull, know-it-all, uncooperative, aggressive, uninterested, etc. All of these must be handled with calm persistent patience, and persuaded through demonstration and repetition to accept the principles and procedures.

c. Understanding.--It has often been said that the successful doctor must have a good "bedside manner." A coach with a good "firing line manner" also enhances his chances for success. The rifleman under instruction, similar to the doctor's patient, is laboring under a strain. He is very sensitive to abruptness, impatience, or lack of sympathy with his difficulties and will immediately

react unfavorably to evidence of such an attitude on the part of the coach.

d. Consideration.--Most men, even those who do not shoot well, enjoy shooting and start out with a lively interest in their work on the range. If the coach is considerate of his pupil and his feelings from the beginning and encourages him throughout his training, he will find coaching a pleasant and rewarding duty.

e. Ability to Maintain Respect.--The fact that a man is assigned the duties of coach classifies him, to those who come to him for instruction, as a technical expert and an authority. They will, therefore, spontaneously extend him their respect from the start. The coach must retain that respect throughout his contact with the pupils by a thorough knowledge of his subject and a quiet dignified demeanor.

f. Alertness.--Even the most apt pupil, in the excitement of firing on the range, will forget or neglect some essential point in his instruction. The coach must be ever alert for mistakes and patiently correct the shooter as often as may be necessary. He must keep the man encouraged throughout his instruction by making the most of every progress that is attained, however slight, and he must check at once any disposition to become discouraged or to lose interest.

g. Helpful Attitude.--In coaching on the rifle range, as in most other lines of instruction, a combative "hard boiled" attitude is rarely effective. A blustering attitude,

"chewing out" the pupil in the presence of others, or the use of profane language merely creates a sullen resentment and destroys the value of the instruction. Only in case of repeated carelessness with respect to safety precautions is severity required and justified.

h. Ability to Provide Encouragement.--The coach can encourage his pupils by convincing them that there is no mystery about good shooting, that the rifle and ammunition are highly developed mechanically for accuracy, that poor scores are due to lack of knowledge and practice on the part of the shooter, and that the coach is there to impart that knowledge and to assist the shooter to gain the practical experience which will make him a good shot. He must emphasize the fact that close observance of a number of simple rules is the secret of success, and that strict attention to the instruction is essential in order to grasp clearly every point covered.

2304. STEPS OF INSTRUCTION

Rifle marksmanship training must follow certain steps of instruction which, if carried out correctly, will result in highly proficient shooters. If one of the steps is incorrectly performed, the shooter will not get the desired results. It is the coach's duty to see that each shooter performs the steps correctly.

a. Basic Steps of Instruction.--The eight basic steps of instruction are:

(1) Sighting and Aiming.--The coach must ensure the shooter understands and applies

the correct method of aligning the sights and placement of the target.

(2) Position.--The coach must have a thorough knowledge of the elements that make up a good position so that he can teach the shooter the proper position and the best method in which he can assume this position. The coach should also not try to put every shooter into the same mold. All shooters cannot get into the same positions and achieve satisfactory results; it is therefore important to build his position to the strengths of his physical makeup applying the elements that make up a good position whenever possible. Coaches should always begin by teaching a position starting with the primary position. If the student can not use the primary position, a careful study by the coach will allow him to modify the position to fit the student. Coaches should be alert to allow only minimum modification required to accommodate the student. The primary position possesses all the elements, in the best form, of a solid position. The elements that make up a good position are:

(a) Bone support.

(b) Muscular relaxation.

(c) Natural point of aim.

(3) Trigger Control.--The coach must be familiar with the common causes of faulty trigger control in order to effectively detect and correct the error. It may be recognized by the shooter's reactions of flinching, bucking, or jerking. See chapter 4 for a discussion of each.

(4) Rapid Firing.--Since time is the greatest factor affecting rapid fire, the coach must train the shooter in the correct procedure.

This can be done in rapid fire exercises by blending the elements of good position, sighting and aiming, trigger control, breathing, and reloading into a smoothly coordinated rhythm.

(5) Sight Adjustments.--To make proper adjustments for his shots or shot groups, the shooter must be taught the operation of the front and rear sights, the elevation and windage rule, and the method used to compute sight changes.

(6) Effects of Weather.--The elements of weather that have an effect on shooting are wind, light, temperature, and humidity. With the exception of wind, these conditions affect some shooters differently than others. The coach must have a complete understanding of all conditions that affect a shooter in order to properly instruct and correct his students.

(7) Zeroing.--The coach must have a thorough knowledge of the principles of zeroing and the method of zeroing in order to teach the shooter the correct procedure.

(8) Use of Data Book.--One of the greatest problems the coach encounters is teaching the shooter to use his data book correctly. In most cases, this can be overcome by impressing on the shooter the importance of the data book.

b. Field Range Instruction.--In addition to the subjects discussed in the preceding paragraph, the coach must have the knowledge and ability to instruct his students in the following subjects on the field range:

(1) Target detection.
(2) Range estimation.

(3) Application of battlesights.
(4) Engaging targets (leads).
(5) Field firing positions.
(6) Time element in engaging a combat target.
(7) Assault fire.
(8) Individual night firing.

CHAPTER 3

CHARACTERISTICS OF THE M16A1 RIFLE

Section I. INFORMATION

3101. GENERAL

To properly employ the M16A1 rifle, all Marines must be knowledgeable of its capabilities. This chapter deals with the characteristics, operation, and ammunition for the M16A1 rifle. The requirements affecting marksmanship training are outlined in the preceding chapters. See appendix C for maintenance, cleaning, and inspection of the M16A1.

3102. BACKGROUND

The most recent addition to the Marine Corps family of infantry weapons is the rifle, 5.56mm, M16A1. The M16A1 is currently the standard rifle issued to Marine Corps units

and is issued to replace both the 7.62mm, M14, and the M14 (modified). Since the M16A1 has the capability of both semiautomatic and automatic rates of fire, each Marine armed with the weapon is a potential automatic rifleman.

3103. WARNING-DANGEROUS PROCEDURES

There are certain safety procedures relative to the handling and firing of M16A1 rifles and ammunition which every Marine should follow to avoid possible injury or death. Some are applicable to small arms, military or civilian. This paragraph is by no means considered a complete list, but discusses major areas in which the individual Marine will have control.

a. Interchanging Bolts.--Never interchange bolts and/or bolt carrier groups between two weapons. The bolts may appear the same; however, interchanging them may result in incorrect headspace, which in turn may cause the weapon to blow up. Due to normal manufacturing tolerances, bolts and their locking recesses will differ. When fitting a new bolt to a rifle, the headspace is checked with special gauges by armorers trained in their use. Incorrect headspace simply allows too much of the cartridge case to protrude out of the chamber. When the cartridge is then fired, the case ruptures, gas is vented into the receiver area, and damage to weapon and/or injury to the shooter will result.

b. Assembly of Bolt Carrier Group.--When assembling the bolt carrier group, ensure the

bolt cam pin is installed. The weapon may fire without it, but will blow up. In this case, the bolt is closed, but will not be cammed into the locking recesses. When the cartridge is fired, the bolt will be moved to the rear immediately, allowing virtually all the gases to vent into the receiver. Serious damage to the weapon and/or injury to the shooter will result.

c. Water in the Barrel.--Failure to remove water from the barrel may result in the weapon blowing up. If the weapon has been submerged in water, exposed to heavy rain and/or dew, or there is any reason to believe there is excess moisture in the barrel, point the muzzle of the weapon toward the ground and pull the charging handle 2 to 3 inches to the rear, breaking the seal formed by the chambered round and allowing the water to drain out of the barrel. Release the charging handle and strike the forward assist to make sure the round is reseated in the chamber and the bolt is locked.

d. M200 Blank Ammunition.--When using the blank firing attachment (BFA), use only M200 blank rounds with the violet tip. Initial issue of the M200 had a white tip; these cartridges should not be used because of excessive fouling.

e. Deformed Ammunition.--Never fire ammunition that is suspected of or has evidence of being tampered with or appears corroded.

f. Ammunition Firing Malfunction.--During slow or rapid firing, if a noticeable

difference in sound or recoil is experienced, further firing should be suspended. Either of these conditions could indicate an incomplete propellant combustion and present the possibility that the projectile has not been propelled with sufficient force to clear the bore. In such instances, the bolt should be retracted slowly to remove and identify the fired cartridge case. The weapon should be cleared and examined for the presence of a bullet remaining in the bore. If the bore is clear, remove any unburned propellant before further firing. If the bullet is lodged in the bore, ensure the weapon is safe and turn in to the armorer. He will take the necessary action to clear the obstruction.

3104. CHARACTERISTICS OF THE RIFLE

a. Description.--The rifle is 5.56mm, magazine-fed, gas operated, air-cooled, shoulder weapon. It is designed for both semiautomatic or full automatic fire through the use of a selector lever. The weapon is equipped with an organic flash suppressor which was designed for launching rifle grenades; however, launching of grenades is not authorized. A "clothespin" bipod may be attached to the barrel directly beneath the front sight between the bayonet lug and front sling swivel. The barrel itself is surrounded by a heat resistant, fiberglass material that serves as a handguard. A forward assist assembly, located on the right rear of the upper receiver, permits the closing of the bolt when this is not done by the force of the action spring. A rubber pad is attached to the butt of the "in-line" stock to partially absorb

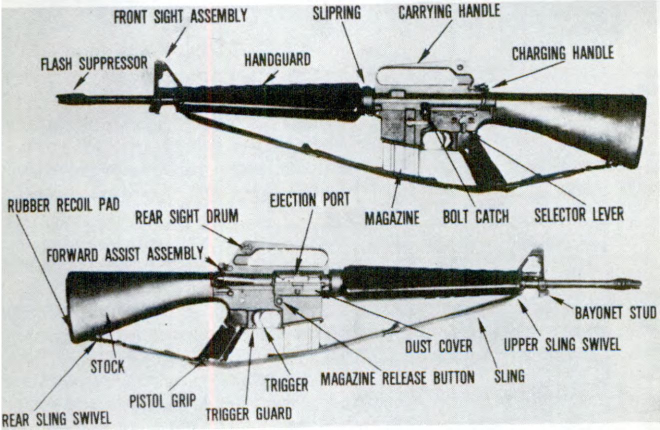


Figure 3-1.--Rifle 5.56mm, M16A1, Right and Left Side View.

the recoil. (See fig. 3-1.)

b. General Data

(1) Gas operated.
(2) Air cooled.
(3) Magazine fed (20- or 30-round box type).
(4) In-line stock.
(5) Semiautomatic and automatic capability.

(a) Cyclic rate of fire: 7-800 rounds per minute.

(b) Maximum effective rate of fire (semi): 45-65 rounds per minute.

(c) Maximum effective rate of fire (auto): 150-200 rounds per minute.

(d) Sustained rate of fire: 12-15 rounds per minute.

(6) Maximum effective range: 460 meters.

(7) Maximum range: 2,653 meters.

(8) Muzzle velocity: 3,150 feet per second (approximate).

(9) Muzzle energy (at the muzzle): 1,200 foot pounds (approximate).

(10) Mechanical features:

(a) Rifling: six grooves, one turn in 12 inches.

(b) Sight radius: 19.75 inches.

(c) Trigger pull: 8.5 pounds maximum; 5.0 pounds minimum.

(d) Sights: rear, flip type, adjustable for windage; front, click type, adjustable for elevation.

(e) Sight adjustment: each click in elevation or windage moves the strike of the bullet 2.8 centimeters/hundred meters.

c. <u>Weights in Kilograms (Pounds)</u>

	Kilograms	(Pounds)
Rifle without magazine and sling	2.95	(6.50)
Empty magazine (aluminum)		
(20 rounds)	.09	(.20)
(30 rounds)	.11	(.25)

	Kilograms	(Pounds)
Full magazine (20 rounds)...	.32	(.70)
(30 rounds)...	.46	(1.01)
Sling, M1....................	.18	(.40)
Combat weight (w/sling and loaded magazine)		
(20 rounds)..........	3.45	(7.60)
(30 rounds)..........	3.60	(7.91)
Bipod, M3....................	.27	(.60)
Bipod case....................	.09	(.20)
Bayonet-knife, M7............	.27	(.60)
Scabbard, M8A1...............	.14	(.30)

3105. OPERATION

a. Loading

(1) Remove the magazine from the weapon. Place a round on top of the follower, nose toward the smooth face of the magazine, and press down. Repeat until the desired number of rounds are inserted.

(2) Cock the weapon, place the selector lever on safe, insert the magazine into the magazine feedway, and push up until a click is heard indicating the magazine is fully seated.

(3) Pull the charging handle fully to the rear and release. Do not ride the charging handle forward. The action spring forces the bolt carrier forward, strips a round from the magazine, and chambers it. Also see paragraph 4502b for alternate procedures. If the weapon is not to be fired immediately, leave the selector lever on "safe" and close the dust cover to prevent dirt from entering the receiver. The dust cover will open automatically when the first round is fired.

(4) The bolt catch will hold the bolt carrier to the rear after the last round is fired. To change magazines for reloading, press the magazine release button and take the magazine from the weapon. Place the new magazine into the magazine feedway and push up until fully seated. Press the bolt stop release lever on the left of the receiver and allow the bolt carrier to go forward. A round is chambered and the weapon is ready to fire.

b. Unloading

(1) To unload the rifle, the shooter should accomplish the following actions:

(a) Place the selector lever on "safe."

(b) Press the magazine release button and remove the magazine.

(c) Pull the charging handle to the rear and inspect the chamber to ensure it is clear.

(d) Lock the bolt carrier to the rear by depressing the lower portion of the bolt catch.

(e) Return the charging handle forward.

(2) The rifle is considered safe only when all of the following conditions are met:

(a) No round is in the chamber.

(b) The magazine is out.

(c) The bolt carrier is to the rear. The use of a "T" block or charging clip is encouraged to ensure bolt carrier is not accijentally allowed to move forward.

(d) The selector lever is on the "safe" setting.

c. Immediate Action.--Immediate action when clearing a stoppage in the M16A1 consists of the following steps:

(1) Tap upward on the bottom of the magazine to ensure it is fully seated.

(2) Pull the charging handle to the rear and release it. (Observe for the ejection of a live or expended cartridge. Do not push the charging handle forward.)

(3) Strike the forward assist assembly to ensure bolt closure.

(4) Attempt to fire the weapon.

CAUTION: If an audible "pop" or reduced "recoil" is exerpeinced during firing, immediately cease firing, remove the magazine, lock the bolt to the rear, and place the selector lever on the safe position. Visually inspect and/or insert a cleaning rod into the bore to ensure there is not a projectile lodged in the bore. DO NOT APPLY IMMEDIATE ACTION!

NOTE: If a projectile is lodged in the barrel of a weapon, do not attempt to remove it. Turn the weapon in to the armorer. He will turn in the weapon to the armory for cleaning the obstruction and inspection and/or repair of the rifle prior to firing.

3106. AMMUNITION

This paragraph includes available information on the types of ammunition used with the M16A1 rifle. The types of ammunition are for the purpose indicated.

a. Classification

(1) Cartridge, 5.56mm, Ball, M193. --The ball ammunition is a center-fire cartridge with a 55-grain, metal-jacketed bullet with a lead alloy core. The primer and case are waterproofed. The ball round is the basic cartridge for field use and has no identifying marks.

(2) Cartridge, 5.56mm, Tracer, M196. --The tracer ammunition has the same basic characteristics as the ball. It is identified by a red painted tip. Its primary uses are for observation of fire, incendiary effect, and signalling. The use of 100-percent tracer may cause deposits of bullet jacket material to form in the bore and rifling grooves of the barrel. Metal fouling is extremely difficult to remove and constitutes a potential safety hazard. Therefore, when tracer is fired, it will be intermixed with ball ammunition in a ratio no greater than one-to-one with a preferred ratio of four balls to one tracer.

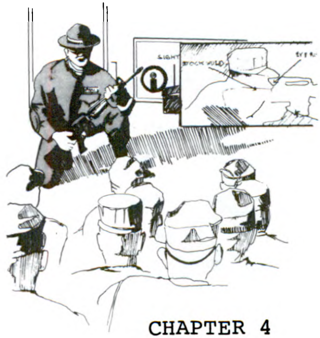
(3) Cartridge, 5.56mm, Dummy, M199. --This cartridge can be identified by six longitudinal corrugations in the case.

(4) Cartridge, Blank, M200.--This cartridge can be identified by the case mouth closed with a seven-petal rosette crimp showing a white tip. CAUTION: Do not use this cartridge for grenade launching!

b. Packing.--Ammunition for the M16A1 rifle can be found packed in two ways:

(1) There are 20 rounds per carton, 36 cargons (720 rounds) per metal box (M2A1), and 2 metal boxes (1,440 rounds) per wire-bound box.

(2) There are 10 rounds per magazine loading strip, 2 loading strips (20 rounds) per packet, 6 packets (120 rounds) per bandoleer, and 2 metal boxes (1,440 rounds) per wire-bound box.



CHAPTER 4

PREPARATORY RIFLE MARKSMANSHIP TRAINING

Section I. GENERAL

4101. PURPOSE

The purpose of preparatory rifle marksmanship training is to teach the Marine the principles of good shooting and prepare him for known-distance range firing and more advanced field firing.

4102. TRAINING

To be proficient, a Marine rifleman must be able to detect targets, determine the ranges to the targets, and hit the targets when he fires upon them. There are many variables affecting an individual's ability to detect and determine the range to combat targets. These will be discussed in chapter 6. However, the

factors affecting a rifleman's ability to fire and hit the target are relatively constant. Essentially, the rifleman must be able to assume a firing position which affords him protection and, at the same time, permits unrestricted observation of the target area. He must hold the rifle in such a manner that he and his rifle form a single unit. He must know how to correctly align his rifle on the target, and finally, he must be able to fire his rifle without disturbing this alignment. The skills needed to accomplish these requirements are known collectively as rifle marksmanship fundamentals.

a. Progressive Training.--As stated previously, the degree of proficiency attained by a rifleman is largely dependent upon correct teaching and application of marksmanship fundamentals. It is important to remember that all marksmanship training is progressive. Each individual must have a thorough understanding of the rifle before he receives preparatory marksmanship training. An individual should not be allowed to fire on a range until he has received preparatory marksmanship training unless his previous experience satisfies the requirement for this training. Preparatory marksmanship training is covered in eight steps. To accomplish progressive preparatory marksmanship training, it is essential that the basic steps be taught in the following sequence:

(1) Sighting and aiming exercises (instruction in the proper relationship of the eye, sights, and target).

(2) Position exercises (proper application of all positions used in range firing).

(3) Trigger control exercises (the act of firing a round without disturbing the position, sight alignment, or sight picture).

(4) Rapid fire exercises (the act of firing a number of rounds quickly within a specified time limit).

(5) Sight adjustments (the proper manipulation of the sights to regulate the strike of the bullet).

(6) Effects of weather (an explanation of the weather conditions that affect the shooter and bullet and how to compensate for these conditions).

(7) Zeroing (the adjustment of the sights to hit a given point at a given range).

(8) Use of data book (the recording of shots and the conditions that affect the bullet and shooter).

b. Safety and Care of the Rifle.--In addition to the preceding subjects, safety precautions (see app. A) and care and cleaning of the M16A1 rifle (see app. F) are subjects of special importance and should be taught and emphasized throughout the training cycle.

Section II. SIGHTING AND AIMING

4201. GENERAL

The exact alignment of the sights with each other and with the aiming point is necessary for accurate shooting. Because of the short distance between the sights, a small error in aligning the sights causes a considerable error at the target. In sighting and aiming, the shooter is concerned with correctly pointing his rifle so the bullet will hit the target when he fires. To do this, he must have the rear sight, the front sight post, and the target or aiming point in their proper relationship. This relationship is known as sight picture. Sight picture involves two elements: correct sight alignment and the proper placement of the target.

4202. SIGHT ALIGNMENT

Figure 4-1 illustrates the correct sight alignment. The top center of the front sight post is exactly in the center of the rear sight aperture. If an imaginary horizontal line is drawn through the center of the rear sight aperture, the top of the front sight post will appear to touch this line. If an imaginary vertical line is drawn through the center of the rear sight aperture, the line will appear to bisect the front sight post. Proper sight alignment can be more easily achieved and maintained by ensuring the sights are properly blackened. This will be covered in detail further in this section.

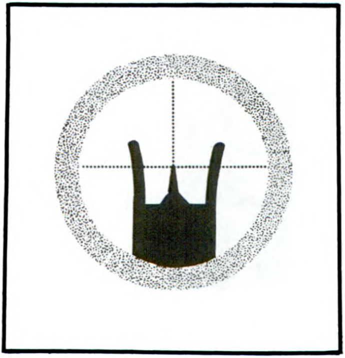


Figure 4-1.--Correct Sight Alignment.

4203. PLACEMENT OF THE TARGET OR AIMING POINT

There are three aiming points employed when firing the M16A1 rifle over the qualification/requalification known-distance course. An imaginary vertical line drawn through the center of the front sight post will appear to cut the target in half. (See fig. 4-2.) An imaginary horizontal line drawn across the top of the front sight post will appear to pass immediately beneath the "A" and "D" bullseye at 200 yards; while at 300 yards it would appear to cut the target in half, and at 500 yards would appear to cross at the neck/shoulder area. These holds are commonly called "6 o'clock hold," "center hold" or "center mass," and "neck" or "shoulder hold," respectively. These different hold positions reduce manipulation of the front sight post. Examples of correct placement of various

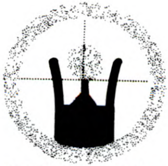


DIAGRAM 1. SIGHT PICTURE
ZEROING AT 200 YARDS.
"A" TARGET

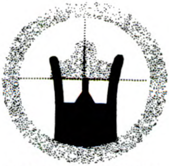


DIAGRAM 2. SIGHT PICTURE
ZEROING AT 200 YARDS.
"D" TARGET

SHORT RANGE APERTURE

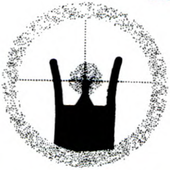


DIAGRAM 3. SIGHT PICTURE
ZEROING AT 300 YARDS.
"A" TARGET

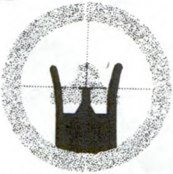


DIAGRAM 4. SIGHT PICTURE
ZEROING AT 300 YARDS.
"D" TARGET

SHORT RANGE APERTURE

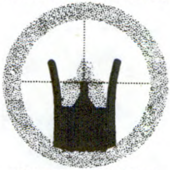


DIAGRAM 5. SIGHT PICTURE
ZEROING AT 500 YARDS.
"B" TARGET (MODIFIED)

"L" OR LONG RANGE APERTURE

Figure 4-2.--Correct Placement of Aiming Points.

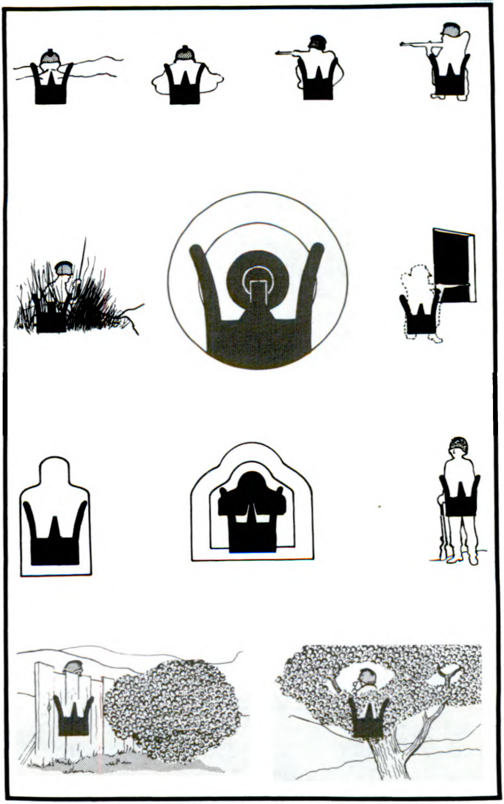


Figure 4-3.--Examples of Correct Placement of Targets With Respect to the Front Sight Post.

targets with respect to the front sight post for field firing or combat firing are shown in figure 4-3.

4204. SIGHT PICTURE

The correct sight picture is obtained when the sights are properly aligned and the aiming point is in the correct relationship to the front sight post. (See fig. 4-2.)

4205. IMPORTANCE OF SIGHT ALIGNMENT

a. Eye Focus.--At some point in his marksmanship training, a Marine may experience difficulty in hitting the target even though he appears to be applying the proper marksmanship fundamentals. The trouble may be either incorrect sight alignment or improper placement of the aiming point. If the shooter understands the principles of aiming, he will rarely commit both errors simultaneously. The reason for this lies in the peculiarities of the eye. The eye cannot focus on two objects at different ranges at the same time. If the shooter focuses his eye on the target, the rifle sights will appear hazy and indistinct, greatly increasing the possibility of incorrect sight alignment. Conversely, focusing the eye on the front sight post causes the target to become indistinct. Therefore, the problem is whether an error in sight alignment or placement of the aiming point results in the greater error.

b. Comparison of Errors.--An error in either sight alignment or placement of the

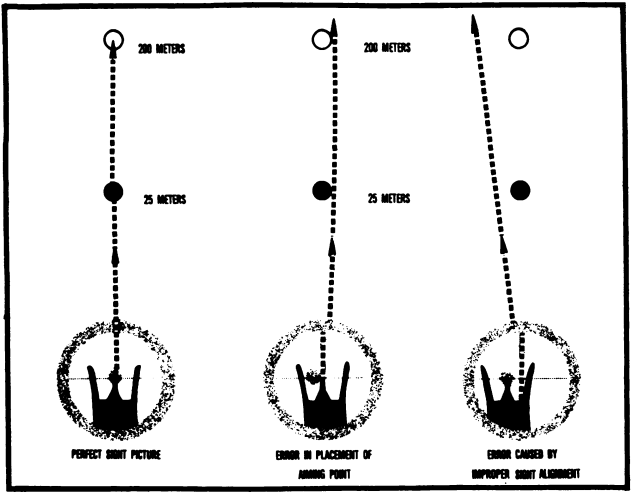


Figure 4-4.--Importance of Correct Sight Alignment.

aiming point will cause the bullet to miss the aiming point (see fig. 4-4); however, a sight alignment error results in a miss that grows proportionately greater as the range to the target increases. On the other hand, an error in the placement of the aiming point causes a miss that remains constant regardless of the range. A hit in the shoulder or lower abdomen, vice the lower chest (point of aim) as a result of an aiming error, can be as effective as a point of aim hit. Consequently, a rifleman

could be several inches off his desired aiming point and still hit the enemy. However, if the error was due to sight alignment, the bullet could miss a man-size target by as much as several feet, depending on the range. Sight alignment, then, is more important than the placement of the aiming point.

c. Method of Sight Alignment.--To ensure the correctness of the sight alignment, the eye must be focused on the front sight post at the instant the rifle fires. However, the target cannot be ignored, so the shooter must alternate the focus of his eye between the target and his front sight post. Initially, he should focus on the front sight post and properly align his sights. Then he shifts his focus to the target and completes the sight picture. Finally, as he squeezes the trigger, he again shifts the focus of his eye to the front sight post thus ensuring correct sight alignment as the rifle fires. At this moment, the sight picture should be similar to that shown in figure 4-2, depending on the range. Notice that the front sight post is distinct while the target and rear aperture appear to be slightly blurred.

4206. EYE RELIEF

Eye relief is that distance from the rear sight aperture to the eye as illustrated in figure 4-5. The shooter should keep his eye as close to the rear sight aperture as possible without straining the muscles of the neck to do so. The closer the eye is to the aperture, the more target area will be visible. Care should be taken not to allow the face or nose to come into

A

B

Figure 4-5.--Eye Relief.

contact with the charging or carrying handle. Recoil against the shooter's face or nose will, in many instances, cause flinching, resulting in inaccurate shots being fired. It is important to have the same eye relief for all shots fired from a particular position. this is accomplished by use of the stock weld, which is the point of firm contact between the rifleman's cheek and the stock. The stock weld will be discussed more in the explanation of positions in section III of this chapter.

4207. CLEANING AND BLACKENING SIGHTS

a. Purpose.--A rifleman can experience difficulty in obtaining the proper sight alignment and sight picture because of shiny or dirty sights. A shiny front or rear sight will glare and partially blind the shooter. Dirt can change the distinctive outline and cause errors in alignment. Thus, it is important in training and in combat to keep the sights clean and

Figure 4-6.--Clean and Blackened Sight.

blackened when necessary. (See fig. 4-6.) A rifle patch or lint-free rag may be used to clean the sights.

b. Methods of Blackening.--There are various methods of blackening the sights. A few commonly used methods include the smudge pot, carbide lamp, oily patch, candle, cigarette lighter, or any ordinary match.

c. Care of the Sights.--The rifle should never be dropped or subjected to any treatment that might burr or bend the front sight post. The front sight wings do an able job in protecting the sight post, but caution on the individual Marine's part is necessary.

4208. SIGHTING AND AIMING EXERCISES

There are three aiming exercises which may be used to effectively teach the principles of correct sight picture. These exercises are best conducted by organizing the unit into two distinct groups called "relays." One relay is designated as shooters, while the other acts as coaches. As each phase is completed, the relays should exchange functions; that is, the shooter becomes the coach and the coach becomes the shooter. One instructor should be available for each 10 students to supervise practical work exercises. This is one area of training that cannot be overemphasized. Throughout the Marine Corps, a lecture is usually the only means used to teach sighting and aiming. Of all the facets of teaching a Marine to shoot, sighting and aiming is the one area in which the instructor cannot see the mistakes made.

The instructor can observe the shooter assume an improper position, see him flinch, and can observe improper trigger control, but he cannot observe the shooter improperly aligning his sights. Therefore, the instructor must be positively satisfied his students fully understand sight alignment before he moves into the next subject or takes them to the firing line. The instructor must have available to him the training devices to teach this subject.

a. First Aiming Exercise.--The instructor explains the proper method to obtain the sight picture using the M16 sighting device (see fig. 4-7). Each Marine is then issued a device and required to establish correct sight alignment and correct placement of the aiming point. The instructor checks the student's results and determines if a correct sight picture has been obtained. This exercise should be continued until the instructor is satisfied that the Marine understands the principles and is capable of obtaining a correct sight picture.

b. Second Aiming Exercise.--The aiming bar (see fig. 4-8) is designed to teach sight alignment and placement of the aiming point. Continual checks are made by the coaches to ensure the students apply the correct principles of sight alignment and placement of the aiming point. This exercise is conducted as follows:

(1) The student moves the sights on the aiming bar until he considers the sight alignment to be correct. The coach checks the result. If the alignment is incorrect, the

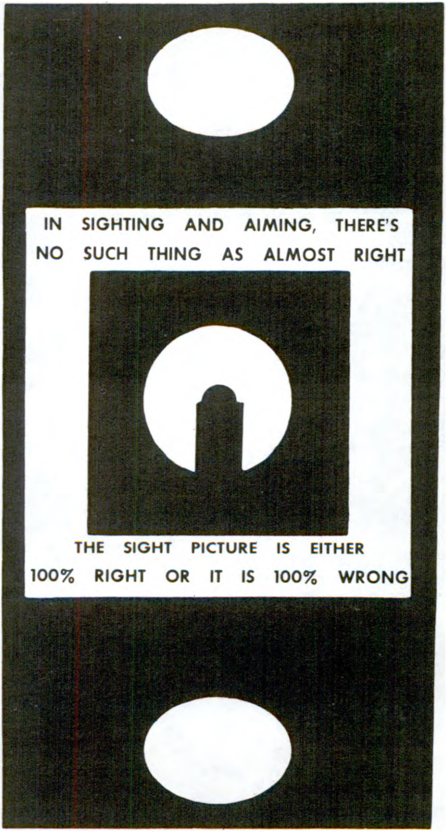


Figure 4-7.--M16 Sighting Device.

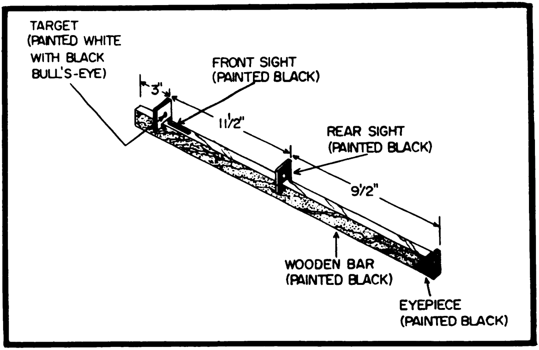


Figure 4-8.--Aiming Bar.

coach determines the error and makes the necessary corrections. If the alignment is correct, the coach moves the sights to cause a misalignment and returns the aiming bar to the student. The student must then correct the misalignment. This exercise is continued until the principles of correct sight alignment are clearly understood by all students.

(2) In the second step of the exercise, the small metal target is placed on the aiming bar, and the student is required to complete the sight picture by placing the aiming point in correct relation to the sight alignment. The work of the student is continually checked by the coach.

c. <u>Third Aiming Exercise</u>.--To conduct this exercise, a rifle, a rifle rest, a target box, and a target disk are required. (See fig.

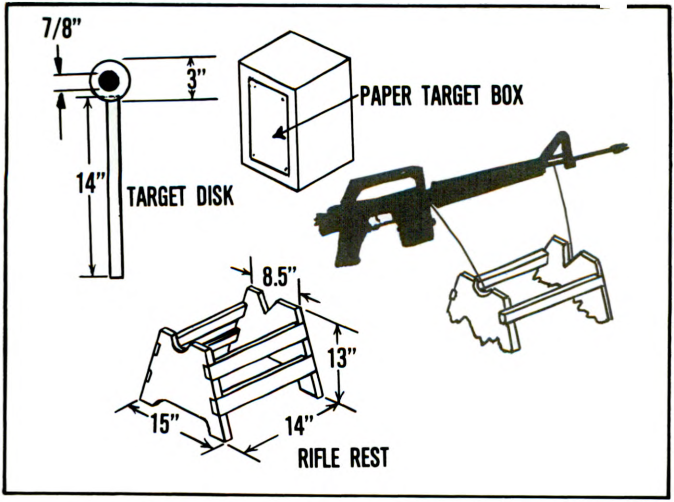


Figure 4-9.--Rifle Rest.

4-9.) The front sight is set at 12 clicks of elevation from the flush position and the rear sight is set at 17 clicks from the extreme left windage, and the rifle is braced in the rest. For the proper adjustment of sights, see section VI, this chapter. The student assumes a position beside the rifle so his eye is positioned as close as possible to the rear sight without touching the rifle. He places both elbows on the ground and rests his chin on the palm of his left hand. The coach sits on the target box located 15 meters from the student. The coach holds the target disk against the

paper on the target box. The student signals the coach with his right hand to move the disk until the correct sight picture is obtained.

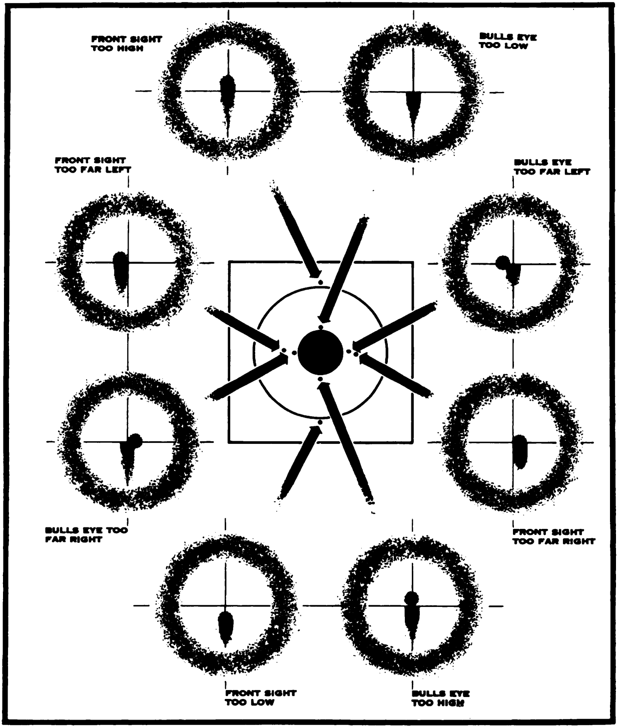


Figure 4-10.--Effects of Errors in Aiming.

He then gives the command, MA. The coach records the sight picture by marking the paper with his pencil through the hole in the disk. This procedure is repeated until three sight pictures, called a shot group, have been recorded. The student must keep his eye in the same position with relation to the sight aperture for each exercise. A good shot group can be covered by the unsharpened end of a pencil. CAUTION: To obtain valid results, there must be no movement of the rifle, the rifle rest, or the target box until all three sight pictures have been recorded. If any of these items move before the three sight pictures have been recorded, the student must repeat the entire exercise. See figure 4-10 for effects of errors in aiming.

Section III. POSITIONS

4301. GENERAL

A correct shooting position is essential to obtain the best results in rifle shooting. The better the position, the easier it is to hold the rifle and control the trigger while the sights are properly aligned. Instruction in sling adjustments should precede instruction in positions since the sling is an important aid to the shooter in the steady holding of the rifle in all positions.

4302. RIFLE SLINGS

a. Purpose.--The rifle sling has a two-fold purpose. First, when adjusted properly, it will provide maximum stability and will instill confidence in the shooter. Second, when used properly, it helps reduce the effects of the recoil.

b. Adjustment of the Web Sling.--For an example of the parade sling, hasty sling, and loop sling, see figure 4-11. This paragraph describes the use and adjustment of the sling, small arms, M1 webbing.

(1) Parade Sling.--To adjust the web sling on the rifle for the parade position, the keeper is unfastened. Pull the feed end of the strap down through the keeper toward the butt plate until the sling is tight. Move the keeper down near the tip of the feed end of the strip and secure.

(2) Hasty Sling.--To adjust the web sling on the rifle for the hasty position, the keeper is unfastened and moved to approximately 6 inches from the upper sling swivel. The strip is then loosened through the keeper until the proper adjustment is acquired. The sling is given a half left twist prior to placing on the arm.

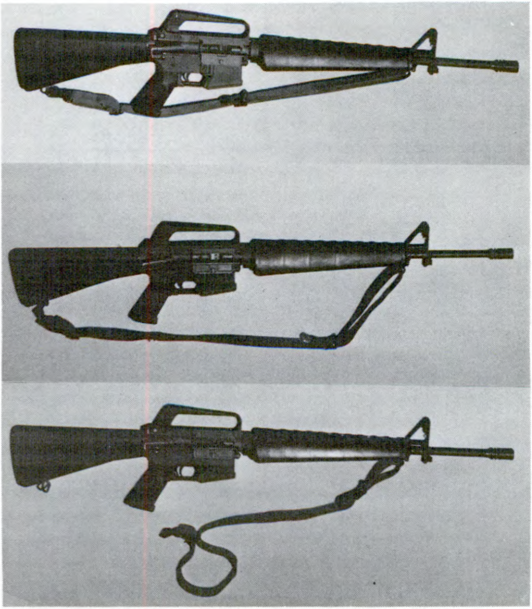


Figure 4-11.--Web Sling.

(3) Loop Sling.--To adjust the loop sling, place the butt of the rifle on the right hip and cradle the rifle in the crook of the right arm. This leaves both hands free to adjust the sling. Unhook the sling from the lower sling swivel; then with the buckle down on the hook, feed the sling through the top of the buckle forming a loop. Give the loop a half turn to the left and insert the left arm through the loop, positioning it well up on the arm above the biceps. Tighten the loop while positioning the buckle on the outside of the arm. As tension is applied to the sling, the loop will tighten. To adjust the sling properly, loosen the keeper and pull the feed end down toward the loop until the proper adjustment is obtained. This adjustment varies with each individual and position. Move the keeper toward the left arm and tighten it. Place the left hand over the sling and under the rifle, move it forward to the upper sling swivel so that the rifle rests in the "V" formed by the thumb and forefinger.

c. Adjustment of the Web Sling (Black). --The following procedures of adjusting the black sling, issued with the M16A1 rifle, will allow the shooter the same support and stability as the M1 sling described above.

(1) Forming the Loop Sling.--Detach the sling from the rifle and place it before you (see fig. 4-12) with the M buckles on the sling at approximately 10 inches from each end.

(a) Step One.--Starting with end of sling to your left, form a loop in center of M buckle by pulling sling upward. (See fig. 4-13.)

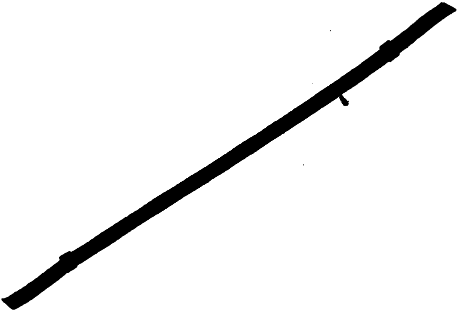


Figure 4-12.--Forming the Loop Sling.

Figure 4-13.--Forming the Loop Sling
(Step One.)

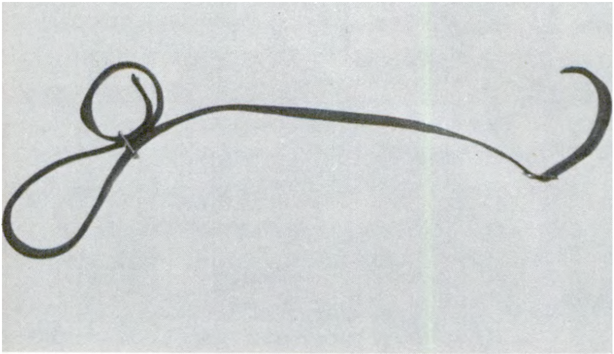


Figure 4-14.--Forming the Loop Sling
(Step Two).

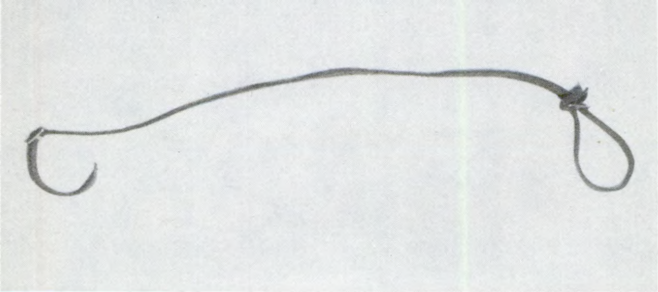


Figure 4-15.--Forming the Loop Sling
(Step Three).

(b) Step Two.--Take loose end of sling and run down through left side of M buckle and pull through approximately 2 inches. (See fig. 4-14.) Tab end will point away from you.

(c) Step Three.--Pull upward on the left side of loop, forming a small knot, to tighten sling down on tab and with tab end protruding approximately 1 inch. (See fig. 4-15.) This forms the loop that will be put on the arm. A closeup is shown in figure 4-16.

(d) Step Four.--Moving to the other end of sling (to your right), pull the end out of the M buckle. (See fig. 4-17.)

(e) Step Five.--Take loose end and start down through the upper sling swivel. Bring loose end up through portion

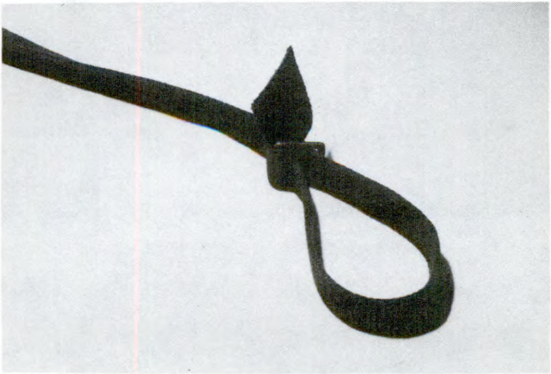


Figure 4-16.--Forming the Loop Sling (Closeup of Step Three).

Figure 4-17.--Forming the Loop Sling
(Step Four.)

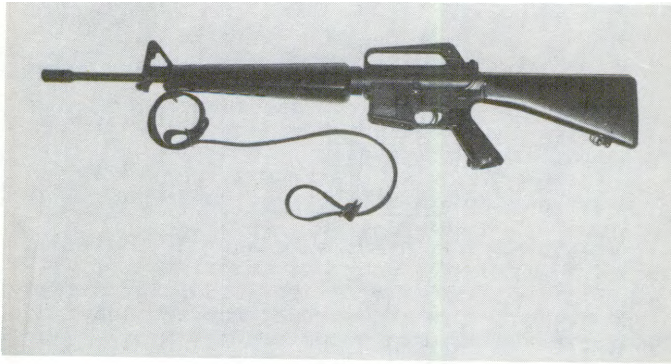


Figure 4-18.--Forming the Loop Sling
(Step Five.)

portion of M buckle nearest stock and back down through the portion of M buckle that loose end was through originally. (See fig. 4-18.) Tab end of sling would protrude through M buckle about 10-12 inches as an initial adjustment.

(f) Step Six.--The M16A1 black sling can now be used as the M1 web sling. The loop sling is shortened in length by pulling the tab end of the sling through the upper sling swivel. To loosen the sling, simply push forward on the M buckle. (See fig. 4-19.)

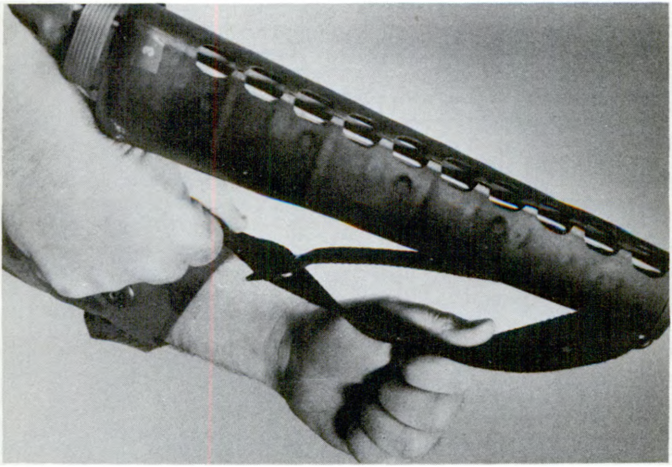


Figure 4-19.--Forming the Loop Sling (Step Six).

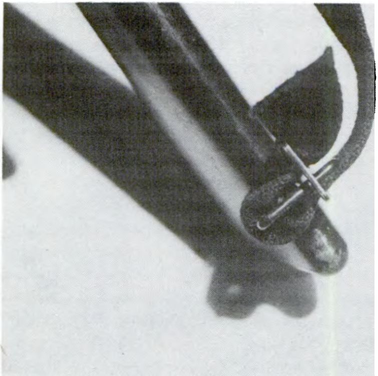


Figure 4-20. Parade Sling.

(2) Parade Sling.--To attach the sling to the lower sling swivel, form a small loop with that portion of the sling used on the arm. Place it over the lower sling swivel, hooking one-half of the swivel through the portion of the M buckle opposite the knot, and pull the sling tight. To tighten the sling and form the parade sling, pull the tab of the sling that is through the upper sling swivel down. (See fig. 4-20.)

(3) Hasty Sling.--Run the upper M buckle forward against the upper sling swivel. The appropriate slack is now in the sling to use in the hasty position.

4303. ELEMENTS OF A GOOD SHOOTING POSITION

The three elements of a good position

are bone support, muscular relaxation, ana natural point of aim on an aiming point.

a. Bone Support.--Positions are designed as foundations for the rifle. It should be

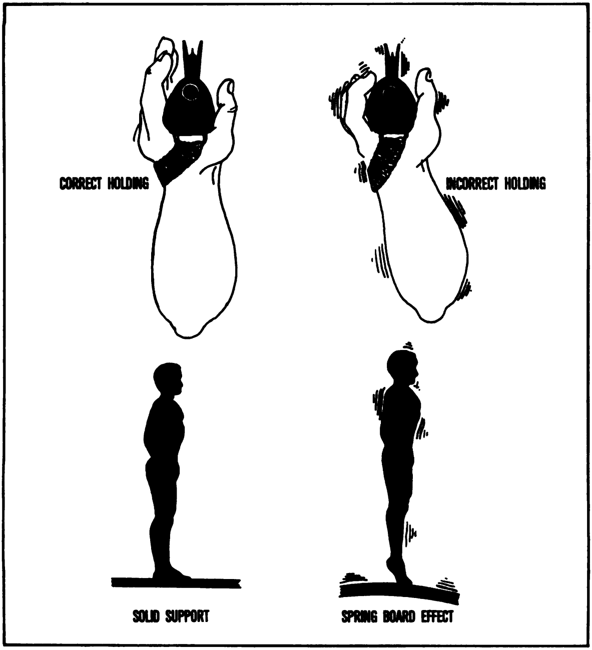


Figure 4-21.--Bone Support.

stressed that a good foundation for the rifle is just as important to good shooting as a good foundation is to a house. If a house is built on a weak foundation, it will not stand erect. The same is true when a shooter establishes a weak foundation (position) for the rifle. It will not withstand the repeated recoil of the rifle in a string of rapid fire. See figure 4-21 for the correct and incorrect position of the left elbow (right-handed shooter) in relation to the rifle. Due to the magazine extending well below the rifle, most shooters will be unable to get the left elbow directly under the rifle. The left elbow should be very close and alongside the magazine. Do not allow the magazine to make a firm contact with the arm, either on the side or on top. (See figs. 4-22, 4-25, and 4-26.)

b. Muscular Relaxation.--The shooter must learn to relax as much as possible in the various firing positions. Undue strain or tension causes trembling which is transmitted to the rifle. However, in all positions, a certain amount of controlled muscular tension is needed. For instance, in a rapid fire position, there should be pressure on the stock weld. Only through practice and achieving a natural point of aim will the shooter learn muscular relaxation.

c. Natural Point of Aim.--Since the rifle becomes an extension of the body, it is necessary to adjust the position until the rifle points naturally at the target. When the shooter takes his position, he should close his eyes, relax, and then open his eyes. With

proper sight alignment, the position of the front sight will indicate the natural point of aim. By moving his feet or body, the shooter can shift the natural point of aim to the desired aiming point.

4304. SHOOTING POSITIONS

The four basic shooting positions used in the Marine Corps are prone, sitting, kneeling, and standing. These positions may be modified to fit the individual. On the battlefield, a Marine rifleman must assume the steadiest possible position which can provide observation of the target area and some cover and/or concealment. Considering the many variables of terrain, vegetation, and tactical situations, there are innumerable possible positions that might be used; however, in most instances, these are variations of those listed above. Some Marines will have more difficulty in assuming a particular position than will others. So long as the rifleman applies the fundamentals of maximum support for his rifle and relaxation, he should be permitted to adjust the position to fit his own body conformation. However, the intent and ultimate goal of this training is effectiveness on the battlefield. It is unlikely the rifleman would attempt a radical position when engaging the enemy because of the time lost in bringing fire to bear on the target. Therefore, modifications, as required by certain individuals, must be consistent with the objective for the training. Throughout position training, the Marine should be continually checked on the proper

application of the principles on which positions are based. This check is the responsibility of the coach who must closely observe the shooter's actions during all phases of fundamental training.

a. Factors Common to All Positions.--There are seven factors which affect holding the rifle steady while aligning the sights and firing the rifle. These factors are the same for all firing positions; however, the precise manner in which they apply differs slightly with the various positions.

(1) Left Hand.--In all positions except the standing position, it is desirable that the web of the forward hand (that portion of the hand between the thumb and index finger) be against the upper sling swivel. The wrist is straight and locked so that the rifle rests across the heel of the hand. The hand itself is relaxed. The fingers can be curled against but not gripping the stock since the rifle should only rest on the left hand. The left wrist should be as straight as possible. The left elbow should be as close to the magazine and receiver as the conformation of the shooter's body will permit. With the left elbow directly under the rifle, the bones (rather than the muscles) of the arm support the rifle's weight. The farther away from this position that the elbow is located, the greater will be the muscular effort necessary to support the rifle. The resulting tensed muscles cause trembling and a corresponding movement of the rifle. However, shooters must avoid excessive muscular strain in positioning

the elbow as this will cause trembling. Consequently, inexperienced shooters must undergo a trial-and-error period until they find the position best suited to them.

(2) Rifle Butt in the Pocket of the Shoulder.--The shooter must place the rifle butt firmly into the pocket formed in the right shoulder. The proper placement of the butt lessens the effect of recoil, helps steady the rifle, and prevents the rifle butt from slipping on the shoulder during firing.

(3) Grip of the Right Hand.--The shooter grasps the pistol grip with the right hand, forefinger on the trigger, and thumb and remaining fingers wrapped around the pistol grip. (See fig. 4-22.) A firm rearward pressure must be exerted by the right hand to keep

Figure 4-22.--Grip of the Right Hand.

the rifle butt in its proper position in the pocket of the shoulder and to keep the butt secure enough against the shoulder to reduce the effects of recoil. The trigger finger should be positioned on the trigger so there is no contact between the finger and the side of the pistol grip (see fig. 4-23). This permits the trigger to be pressed straight to the rear without disturbing the shooter aiming the rifle.

(4) Right Elbow.--The placement of the right elbow provides balance to the shooter's position. Correctly positioned, the elbow helps form a pocket in the shoulder for the rifle butt. The exact location of the right elbow varies in each position and will be described in the explanation of each position.

(5) Stock Weld.--The stock weld is used in firing the M16A1 because of the position of the right thumb around the pistol grip. It is particularly important that the shooter places his cheek against the stock at the same

Figure 4-23.--Position of the Trigger Finger.

Figure 4-24.--Stock Weld.

point each time he fires to enable the eye to be positioned the same distance behind the rear sight aperture each time the rifle is aimed and fired (eye relief) (see fig. 4-24). This results in the size of the rear sight aperture appearing the same each time a sight picture is obtained, thus further assisting in maintaining correct sight alignment.

(6) Breathing.--If the shooter continues normal breathing while aiming and firing the rifle, the movement of his chest will cause a corresponding movement of the rifle. To avoid this, the Marine must learn to hold his breath for the few seconds required to aim and fire the rifle. Initially, he takes in a normal breath, exhales to a normal, relaxed point, and then holds his breath for the remainder of the time required to deliver the

shot. Each shooter must understand that muscular tension and blurring of vision begins to occur after he has held his breath 15-20 seconds.

(7) Relaxation.--The Marine must be able to relax properly in each firing position. Undue muscular strain or tension causes trembling in parts of the body, which in turn causes a corresponding movement of the rifle. If he finds that a particular position causes excessive strain, he should adjust that position slightly until he is able to relax, providing he does not violate any of the other steady hold factors. An indication of a properly relaxed firing position is the Marine's ability to relax and still maintain his sight picture.

Figure 4-25.--High Prone Position.

b. Prone Position.--(See figs. 4-25 and 4-26.) The prone position, high or low, is relatively steady and easy to assume. The position presents a low silhouette and is eadily adapted to the use of cover and support. The prone position is used in both slow and rapid fire and there is only one minor difference between them. In rapid fire, the position need be only slightly tighter than for slow fire to ensure the shooter has maximum recovery time from the minor recoil of the M16A1 and so as not to disturb the natural point of aim. As the sling is attached to the barrel, extreme care should be exercised to use the same sling tension established for each position each day. Only a minor difference in sling

Figure 4-26.--Low Prone Position.

tension will cause the zero of a particular position to change. In slow fire, the position is more relaxed and the body is lowered. In this position, it is not necessary to consider recoil, since there is time to recover the correct position between shots. Lowering the body may be done by readjusting the sling. Requirements for the prone position are that the body be extended on the ground, head towards the target. The rifle will be supported by both hands and one shoulder only. No portion of the arms below the elbows or any part of the rifle shall rest upon the ground or any artificial support nor may any portion of the rifle or body rest against any artificial support. The magazine may touch the person of the shooter but may not touch the ground.

(1) Assuming the Position.--To assume the prone position, the individual stands facing the target with the left hand forward to the upper sling swivel and the right hand grasping the stock at the heel of the butt. He does a half right face, spreads his feet a comfortable distance apart, shifts his weight slightly to the rear, and drops to his knees. An imaginary line is drawn from his right knee to the target. The toe of the rifle butt is placed well forward to the imaginary line. The individual pivots on the rifle, down on his left side, placing his left elbow again well forward on the imaginary line. With his right hand at the rear of the stock, he places the butt of the rifle into his right shoulder. The pistol grip is grasped with the right hand and the right elbow is lowered to the ground so that the shoulders are approximately level. The individual then secures a stock weld and relaxes into the tension of the sling. The

magazine should not rest on the arm; it may cause discomfort to the shooter when the rifle recoils. It is possible to cause erratic performance or even malfunctions by putting pressure on the magazine with the arm.

(2) Breathing Position Check.--To adjust the natural point of aim to the target, use the left elbow as the pivot point and move the body either right, left, forward, or rearward until the sights are aligned on the target. If, when breathing, the sights move from 6 o'clock to 12 o'clock on the target, it is a well-balanced position. (See fig. 4-27.)

(a) Rifle vertical (sights level).

(b) Left hand forward to upper sling swivel (when possible).

(c) Rifle resting in "V" formed by the thumb and forefinger of the left hand, and the weight supported by the heel of the hand and not the fingers.

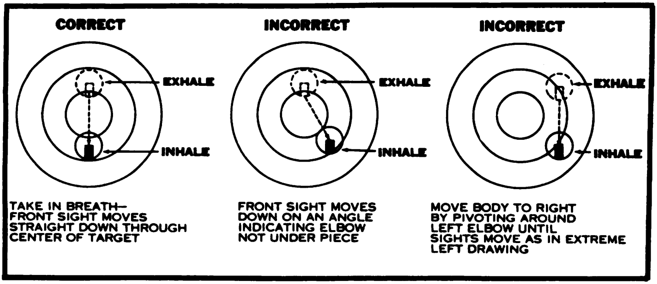


Figure 4-27.--Breathing Position Check.

(d) Left elbow well under the receiver (as far as body conformation permits without putting pressure on the magazine).

(e) Sling high on left arm.

(f) Rifle butt close to the neck in the hollow of the shoulder.

(g) Shoulders approximately level to prevent canting of the rifle.

(h) Body well behind the rifle to absorb the recoil.

(i) Cheek firmly fixed on the stock (stock weld).

(j) Daylight between trigger finger and pistol grip.

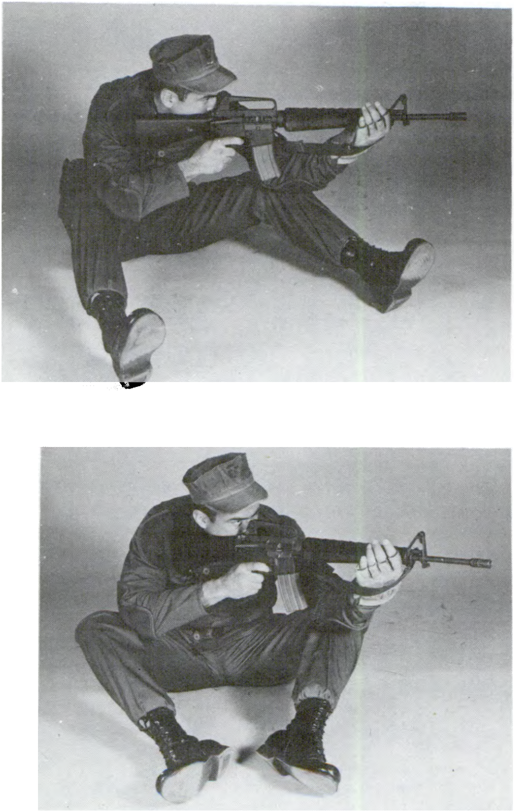
(k) Trigger finger applying pressure straight to the rear.

c. Sitting Position.--There are three variations of the sitting position: open leg, crossed leg, and crossed ankle. For the basic shooter, the crossed ankle should be considered the primary position. The instructor can modify the positions on an individual basis. The crossed ankle position offers the most support and stability for the amount of time required to learn the position. Because of different body configurations, there are Marines who are unable to use the crossed ankle or crossed leg position. In rapid fire, the sling should be only tight enough to permit rapid recovery from the minor recoil and to maintain the natural point of aim. Sling tension should not be varied each day. (See par. 4304b.)

(1) Open Leg.--To assume the open leg position, the sling must be shortened about 2 or 3 inches from the prone position adjustment. The shooter faces the target, does a

half right face, and sits down in place. He then places his feet a comfortable distance in front of him (about 2 1/2 feet apart). By bending foward at the waist, the shooter puts his left upper arm down along the left shin bone. Using the right hand at the butt of the rifle, he pushes the rifle forward, places the butt of the rifle into the right shoulder, moves the right hand forward, grasps the pistol grip, and then lowers the upper arm until it rests inside the right knee. By pointing his toes inward, the shooter prevents his knees from spreading, therefore maintaining pressure on the right upper arm. The position is completed by relaxing the weight forward and assuming the correct stock weld. As in the prone position, the magazine should be kept clear of the arm. For shooters who have a short torso and who experience difficulty in positioning the feet as shown in figure 4-28, the following method may be utilized. Position the feet in a similar manner as described, but place the outside portion of the soles flat on the ground and completely relax the legs. All other instructions remain the same. This method precludes the use of leg muscles to hold the ankles rigid and toes pointed inward. There should be less movement encountered in the lower portion of the body by the utilization of this position. (See fig. 4-28.)

(2) Crossed Leg.--The difference between the crossed leg and the crossed ankle positions is very slight. In the crossed leg position, after sitting down, the shooter simply leaves his feet in place and positions his upper arms inside his knees. Many Marines prefer this position because it is quickest to assume. (See fig. 4-29.)



A

B

Figure 4-28.--Open Leg Sitting Position.

Figure 4-29.--Crossed Leg Sitting Position.

Figure 4-30.--Crossed Ankle Sitting Position.

(3) Crossed Ankle.--In this position, the shooter sits down, keeps his feet crossed, and slides them forward. He then bends at the waist and places his upper arm inside his knees. (See fig. 4-30.)

(4) Position Checks.--In the three sitting positions, as in the other positions, it is mandatory to adjust the natural point of aim to the target to eliminate using muscles to align the sights. This may be accomplished by moving either foot, both feet, or the buttocks until the sights are naturally aligned on the target with no muscular tension. There are certain checks that should be made to ensure that the positions adhere to the fundamentals:

(a) Rifle vertical (sights level).

(b) Rifle resting in the "V" formed by the thumb and forefinger and supported by the heel of the left hand, fingers relaxed.

(c) Left hand forward to upper sling swivel (if possible).

(d) Left elbow approximately under the receiver, without putting pressure on the magazine.

(e) Right upper arm blocked in front of the right knee.

(f) Sling high on left arm.

(g) Shoulders approximately level to prevent canting of the rifle.

(h) Butt of rifle close to neck and positioned in the hollow of the shoulder.

(i) Cheek firmly fixed on the stock weld.

(j) Daylight between trigger finger and pistol grip.

(j) Daylight between trigger finger and pistol grip.

(k) Less distance between the knees than the heels (open leg position).

(l) Trigger finger applying pressure straight to the rear.

d. Kneeling Position.--As with the sitting position, there are three variations of the kneeling position: low position (see fig. 4-31), medium position (see fig. 4-32), and high position (see fig. 4-33). For the basic shooter, the high kneeling position should be considered the primary position. The low kneeling position should be used only as a last resort. It offers the least bone support and produces the most muscle tension of the three positions. Requirements of the kneeling position are that the

Figure 4-31.--Low Kneeling Position.

Figure 4-32.--Medium Kneeling Position.

Figure 4-33.--High Kneeling Position.

weight of the body be supported on the right knee and foot and left foot (or left knee and foot and right foot); no other part of the body may come in contact with the ground. Sitting on the side of the foot vice the heel is permitted. The rifle will be supported by both hands and one shoulder only. The elbow of the arm supporting the rifle may rest on or just inside the knee. The elbow of the trigger arm will be free from all support. A shooter excused from firing the kneeling position, for any reason, will be required to fire his kneeling rounds in the standing position.

(1) Assuming the Position

(a) Position of the Right Leg. --In the kneeling position, the shooter kneels on his right knee so that the right leg runs parallel to the target. In kneeling on the right knee, the shooter can be in one of three positions. Each position is different and each givės the body a different height. In the low position, the ankle is turned in with the buttocks in contact with the side of the foot. In the medium position, the ankle is straight and the foot stretched out with the shoelace in contact with the ground. The buttocks are then in contact with the heel. In the high position, the ankle is straight. The toe of the shoe is in contact with the ground and is curled by the body weight as the shooter kneels. When the right foot of the shooter has been placed in the desired position, the right portion of the buttocks is placed on the right heel making a solid contact. When sitting on the side of the foot, the right buttock is placed on the inside of the right ankle. However, when using either position, care should be taken that the

buttocks are not placed too far to the rear resulting in a hard to balance position.

(b) Position of the Left Foot.--The left foot is extended toward the target with the foot flat on the deck. For best results, a level spot is needed. For maximum support, the toes should be pointed approximately in the direction of the target. If excess side movement is noticed, it can be reduced by turning the toes of the left foot to the right. When in position, the left foot may be pushed forward or pulled back slightly to lower or raise the muzzle, if required.

(c) Position of the Left Leg.--The lower left leg must be positioned properly to control the rifle and receive maximum support. From a front view, the lower left leg should be approximately vertical. In this position, the left leg in turn will support the weight of the body more readily, thus utilizing the bone principle discussed in paragraph 4303.

(d) Position of the Arms.--The right elbow is held at a natural point (bent at about a 45-degree angle) to provide the least muscular tension and to ensure a pocket is formed in the shoulder. The left arm arm supports the rifle, so it is important to know the positions of the various parts of the arm. On the upper arm, a flat surface can be felt, just behind the elbow. This portion of the arm must be placed in a similar spot found on the right side of the left knee in order to receive maximum support. Placing the flat surfaces of the arm and knee together results in the elbow being forward of the knee, and also allows the weight of the body to be transferred forward to the left leg. The left leg must be placed under

the rifle to receive maximum support. Daylight is seen between the sling and the crook of the elbow which assures the shooter that the sling is supporting the forearm with the upper arm. The sling supports the bones, and in turn, the bones support the rifle resulting in a steadier position. Approximately 60 percent of the weight of the body is transmitted forward to the left leg reducing the tension on the right foot and leg resulting in a more relaxed position. A tripod is formed with the left foot, right knee, and right foot. Placing any of the three points closer to the other will result in an unbalanced position.

(2) Position Checks.--Checks that should be made to ensure that the position adheres to the fundamentals are as follows:

(a) Rifle vertical (sights level).

(b) Rifle resting in the "V" formed by the thumb and forefinger, fingers relaxed.

(c) Left hand forward to sling swivel (if possible).

(d) Left leg approximately vertical from frontal view.

(e) Position of right elbow.

(f) Weight of the body forward on left leg.

(g) Cheek fixed firmly on the stock weld.

(h) Daylight between trigger finger and pistol grip.

(i) Trigger finger applying pressure straight to the rear.

(j) Sling high on the arm.

(k) Daylight between the sling and crook of left elbow.

e. Standing Position.--This is the least steady and most difficult position; however, it can be mastered with proper use of the fundamentals. Requirements for the standing position are that the body is erect on both feet with no other portion of the body coming in contact with the ground or any other supporting surface. The rifle will be supported by both hands and one shoulder only. Though not recommended, the elbow of the forward arm may be placed against the body, providing the cartridge belt or magazine pouches are not used for support.

(1) Assuming the Position.--In the standing position, the shooter faces his target, executes a right face, and spreads his feet a comfortable distance apart. Normally, this distance will not exceed the width of the shoulders. With his right hand grasping the pistol grip, he places the toe of the rifle butt high against his shoulder and close to the neck, so that the sights are level with his eyes. (See fig. 4-5A.) He holds his right elbow high, well above a 45-degree angle, to form a pocket in his right shoulder and to bring the rifle sights up to his eyes vice lowering the head to the sights. This also permits him to exert a strong rearward pressure with his right arm and hand. He holds most of the rifle weight with his right arm and places his left hand under the rifle in a position to best assist in supporting and steadying the rifle. Because of the preciseness required for trigger control, shooters should not be taught to grasp or hold the magazine in any manner. Using the magazine as a "palm rest" with the forward arm resting on the body, any body movement will be

immediately transmitted to the rifle. He distributes his weight evenly on both feet and hips. (See fig. 4-34.) The stock weld for standing is very seldom the same as for sitting, kneeling, or prone. In the standing position, it is difficult for many shooters to place the cheek against the stock as in other positions. (See fig. 4-5B.) To maintain consistent eye relief, care must be taken to place the cheek against the stock the Each individual can, by practice and experimentation, determine the feel of his proper stock weld. Finding a natural point of aim in the standing position is complicated because of the uneven terrain on most firing lines. The shooter should always strive to have both feet level, but he can move either foot in any direction to take advantage of "hills" and "valleys" until he has his desired point of aim. If at any time the shooter loses his natural point of aim, he must readjust prior to firing the next shot. The shooter may relax between shots, but he must always keep his feet in place.

(2) Shooting in Wind.--Some mention must be made concerning the technique of shooting in the wind while in the standing position. In the standing position, the entire body is exposed to the wind which, coupled with the fact that only the feet are in contact with the ground, causes the rifle to move considerably when the velocity or direction of the wind changes. It is possible to get good results even under these unfavorable conditions if the shooter has a good mental attitude. If he has trained intensively, he knows that he is well-prepared to fire effectively. The shooter must be able to assume his position and wait for a lull, or at least a period when the wind

Figure 4-34.--Standing Position.

direction and velocity are constant. While he is waiting, he allows his body to move freely with the wind. When the lull occurs, he quickly acquires the correct sight picture and executes the fundamentals of trigger control. Although his movement may be greater than usual, he must still fire a relatively well-aimed shot. Unsatisfactory scores are usually caused by the temptation to "snap shoot" when the front sight is in the vicinity of the black. Snap shooting will almost invariably result in a jerk, which has disastrous results.

(3) Holding Exercises.--One of the best methods of improving scores in the standing position is through the practice of holding exercises. In these exercises, the shooter "dry fires" and remains in position for a specified period of time. This period should be gradually increased from 30 seconds to one minute as the training progresses. To avoid excessive fatigue, no more than 20 repetitions should be conducted during one training session.

(4) Position Checks.--The points to be checked to ascertain if the position is correct are as follows:

(a) Feet level and comfortably spread apart.

(b) Weight equally distributed on both feet and hips.

(c) Butt of rifle high in shoulder close to neck.

(d) Natural point of aim on the target.

(e) Consistent stock weld.

(f) Neck and torso relaxed.

(g) Daylight between trigger finger and pistol grip.

f. Sling Adjustment.--Once a solid position is obtained, the sling should be marked and used at the same adjustment for that position each day. Varying sling tension will affect the strike of the bullet, making establishment of a zero difficult. Once the sling adjustment (tension) is established for each particular position, it should not be changed.

4305. SAFETY FACTORS

Marines conducting training as well as those being trained must be made aware of the possible safety hazards involved during live fire exercises. The risk of an accident is at its highest during the rapid fire stages.

a. Prior to Rapid Fire.--One area of concern, common to both sitting and prone rapid fire, occurs just as the firing commands are completed and before the targets are run up. Through improper instruction or the misguided notion of gaining an advantage, the shooter will assume a stooping, bent-over position, falsely believing he will get into position faster than if he remains basically erect. By doing this, he has created conditions adverse to good marksmanship. (See fig. 4-35.)

(1) Muscle Strain.--Since the targets are not always raised immediately, he must remain in a very tense position, which is both tiring and mentally self-defeating.

(2) Concentration.--The several seconds he is in this posture, immediately prior to firing, all his concentration is on seeing the targets move and reacting to that stimulus. His last moments of concentration should be focused

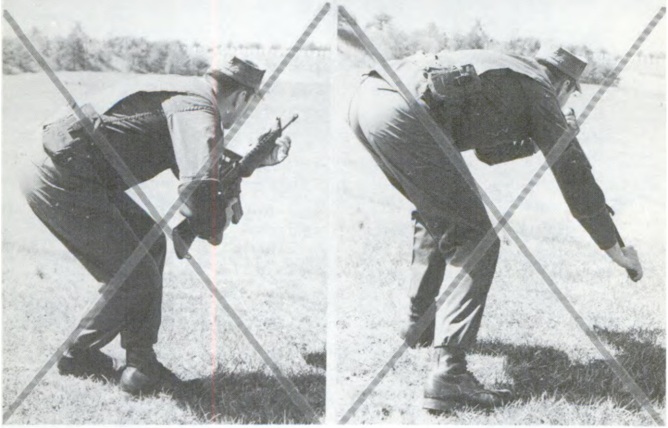


Figure 4-35.--Bent-Over Position.

upon the proper fundamentals he is going to employ rather than the single thought of the target's moving.

(3) Mental Strain.--During the time the shooter is in this "ready" posture, he is mentally working himself into an adverse mental state. He is not breathing properly, which will not allow him to relax. By not staying as relaxed as possible, he is causing his heartbeat rate to increase, thereby increasing the pulse beat. His anxiety is increasing, which causes a novice shooter to literally forget what he is doing or what he is supposed to do.

(4) Action or Reaction.--When the shooter takes up this "ready" position, he is

causing muscles in his legs, back, chest, neck, and arms to be tense, mainly to hold him in that position. When the targets appear, he then reacts by causing the muscles to relax, then again tense to propel him in the desired movements. In this process, because of the other factors, he is more prone to mistakes and inaccuracies. Conversely, by remaining in the relaxed, basically erect position, he avoids all the negative factors. He is relaxed, breathing properly, planning his moves, concentrating on positive thoughts and when the targets appear, he goes into ACTION, rather than REACTION, and will make fewer mistakes, which produces a higher score. Marksmanship instructors can easily prove to themselves, by observing the rapid-fire stages closely, that the relaxed shooter gets into position and fires his first round as fast, if not faster, than the shooter that has placed himself into such a tense position.

b. Assuming the Sitting Position for Rapid Fire.--All preparatory procedures and commands have been completed up to and including LOCK and LOAD. After the shooter completes the steps for loading, he remains in a relaxed and basically erect position. While listening for the remaining firing line commands, he is looking down range and mentally preparing himself to fire. (See figs. 4-36 and 4-37.) As the targets begin to appear, he starts to assume the sitting position. The key is to keep the butt of the rifle at or near his waist as he starts into position. (See fig. 4-38.) Once he is about half the way to the ground, his leg and torso have formed a vee that will hold the butt

Figure 4-36.--Standing Up Ready for Sitting Position (Rear View).

Figure 4-37.--Standing Up Ready for Sitting Position (Side View).

Figure 4-38.--Moving Into Sitting Position.

of the rifle in place until he is ready to place the rifle into his shoulder. (See fig. 4-38.) He can then take his firing hand off the butt of the rifle and break his fall. (See fig. 4-39.) Figure 4-39A illustrates the proper method; figures 4-39B and 4-39C illustrate unsafe methods. This procedure will automatically control the direction of the muzzle requiring only a minimum of attention by the shooter and provide a much greater degree of safety for other Marines adjacent to the shooter and for the shooter himself. Figure 4-40A illustrates proper and safe method of breaking the shooter's fall. Figures 4-40B and 4-40C illustrate two unsafe methods.

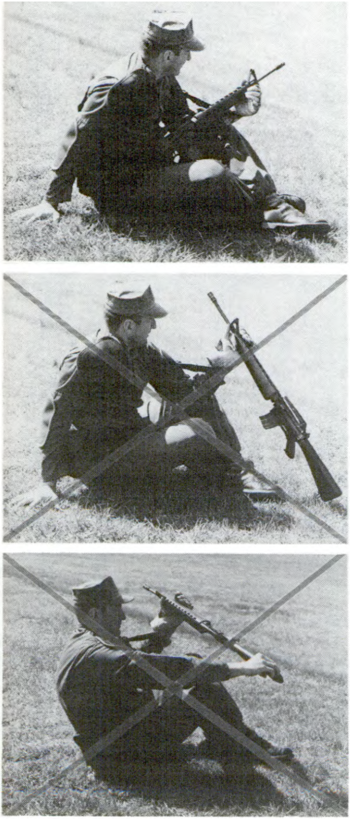
c. Assuming the Prone Position for Rapid Fire.--All preparatory procedures and commands

A

B

C

Figure 4-39.--Moving Into Sitting Position.



A

B

C

Figure 4-40.--Moving Into Sitting Position and Breaking Fall.

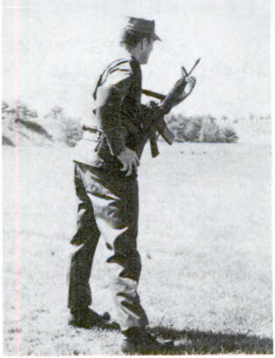


Figure 4-41.--Standing Position Preparing for Prone Rapid Fire (Rear View).

have been completed up to and including LOCK AND LOAD. After the shooter completes the steps for loading, he remains in a relaxed and basically erect position. As with sitting rapid fire, the shooter is listening for the remaining firing line commands; he is looking downrange and mentally preparing himself to fire. (See fig. 4-41.) As the targets begin to appear, he starts to assume the prone position. As the shooter starts into the position, even before he drops to his knees, the safety problem begins. The key to solving the safety hazard is positive control of the forward arm. The natural tendency to draw the arm back to retain the power of the shoulders to keep the body from falling too fast. This immediately points the muzzle toward the adjacent shooter. Then to compound

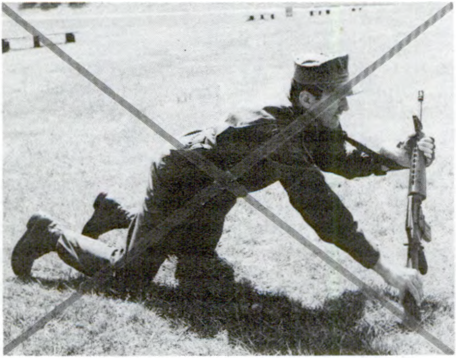
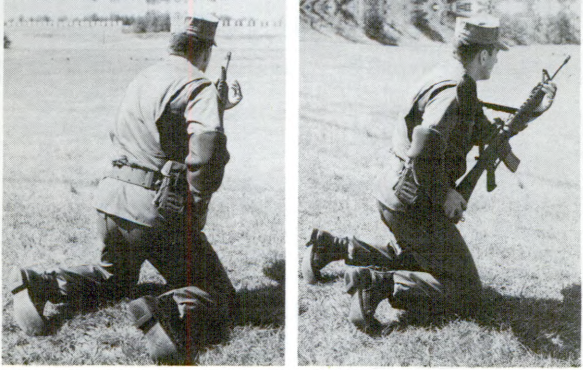


Figure 4-42.--Moving Into Position, Breaking Fall in Unsafe Manner.

the safety hazard, the shooter keeps the forward arm back and extends the butt of the rifle to break his fall. Now he has pointed the rifle at the coach and, possibly, even the shooters preparing to move up on later relays. (See fig. 4-42.) To solve this safety hazard, repetitious training in assuming the position properly is necessary with emphasis in breaking the fall. Alternatively changing the procedure of getting into the prone position may be necessary. This will be dictated by the individual shooter, his ability to coordinate his movements, and in the judgment of the marksmanship instructor conducting the training.

(1) Left Arm.--The left arm must be extended to the maximum, toward the target,



A B

Figure 4-43.--Assuming Prone Position.

throughout the period of assuming the position. The shooter drops to his knees and maintains the butt of the rifle at his hips. (See figs. 4-43A and 4-43B.) This will properly control the muzzle in keeping it elevated and pointed downrange. As the shooter falls forward, he ensures his left arm is extended fully toward the target. He then breaks his fall, using the rifle butt, and maintains the muzzle of the rifle in a safe, downrange direction. (See figs. 4044A and 4-44B.)

(2) Right Hand.--If the shooter is unable to coordinate his movements to accomplish the prone position described above, then his technique of assuming the prone position

A

B

Figure 4-44.--Breaking Fall.

Figure 4-45.--Placing Rifle Butt on Deck (Rear View).

must be modified. The use of the right hand to break his fall, vice the butt of the rifle, will reduce the safety hazard. After dropping to his knees, the shooter simply sets the butt of the rifle on the ground immediately in front of his knee. (See fig. 4-45.) Continuing to fall forward, he extends his right arm and catches himself with his right hand. As he does this and continues to roll down onto his side, the rifle butt will drag lightly upon the ground and the muzzle of the rifle will remain pointed in the desired direction, elevated, and

Figure 4-46.--Breaking Fall With Right Hand.

downrange. All other aspects of assuming the prone position remain the same. (See fig. 4-46.)

4401. GENERAL

Trigger control is the skillful manipulation of the trigger by the shooter causing the rifle to fire without disturbing the alignment of the rifle with respect to the target.

4402. APPLICATION OF THE TRIGGER FINGER

a. Finger Placement on the Trigger.--The trigger finger should contact the trigger at some point between the tip and first joint of finger. The placing of the trigger finger on the trigger is an individual preference and depends greatly on the size of the shooter's hand and the manner in which he grasps the pistol grip.

b. Trigger Movement.--The movement of the trigger to the rear consists of one phase: when the trigger finger initially applies pressure to the trigger, a definite resistance is encountered--the beginning of the trigger weight. Trigger weight (usually 5 to 8½ pounds) is the amount of pressure the shooter must apply to the trigger in order to release the hammer.

c. Technique of Trigger Control.--During the firing process, a gradual increase of pressure is applied straight to the rear on the trigger as long as the sight alignment and sight picture remain good. Trigger control is very important since the sight picture cannot be held in alignment continuously. The shooter must be

able to stop pressure on the trigger when the sight picture is not good. The shooter will apply pressure to a point when he will know that only a small additional pressure on the trigger will cause the hammer to fall. He then applies this small additional pressure when the sights are aligned without causing movement in the weapon. The results of a good steady position, perfect sight alignment, proper aiming point, and accurate correction for wind and elevation are of no value unless precise trigger control is achieved. This same prerequisite is also applicable to sight alignment.

4403. FACTORS AFFECTING TRIGGER CONTROL

a. General.--The upper part of the trigger finger should be kept clear of the pistol grip to allow a front-to-rear movement in the manipulation of the trigger. The finger touching the side of the grip will cause pressure to be applied at a slight angle rather than straight to the rear. Such a side pressure, no matter how slight, will tend to pull the sights off the aiming point. A firm grip with the hand on the pistol grip is essential for good trigger squeeze. The hand must be anchored in order for the trigger finger and trigger to move instead of the hand when the trigger weight is encountered. This firm grip should be maintained by the three fingers and thumb of the hand holding the pistol grip. If the shooter has a loose grip when applying pressure on the trigger finger, the loose hand must anchor itself by tightening its hold on the grip before enough finger pressure can be exerted to move the trigger weight. Therefore, a Marine thinks he is

pressing the trigger when, in reality, all he is doing is squeezing the grip. This, in turn, leads to a combination of errors.

b. Common Errors.--Trigger control is the most difficult marksmanship skill for the inexperienced shooter to master. The majority of shooting errors stem directly or indirectly from the improper application of this technique. The following are some of the more common errors:

(1) Flinch.--The flinch is the shooter's reaction to the anticipated recoil of the exploding round. It is indicated by the shooter moving his head, closing his eyes, tensing his left arm, moving his shoulders to the rear, or a combination of these.

(2) Buck.--The buck is an attempt by the shooter to take up the recoil, just before the weapon fires, by tensing his shoulder muscles and moving his shoulder forward.

(3) Jerk.--The jerk is an attempt by the shooter to make the rifle fire at a certain time by rapidly applying pressure on the trigger and disturbing the alignment of the rifle with respect to the target.

4404. FOLLOWTHROUGH

Followthrough is the continued application of the fundamentals after each round has been fired. That is, the shooter does not shift his position, move his head, or let the muzzle of the rifle drop until a few moments after the rifle has been fired. This procedure will ensure that there is no undue movement of the rifle until after the round is fired and, from

a training viewpoint, can assist the shooter to correct his own errors. By knowing his sight picture the instant the round is fired, the Marine can analyze his shot group in relation to this sight picture and correct himself accordingly. In combat, followthrough allows the Marine to observe the strike of his bullet in relation to his aiming point, enabling him, if necessary, to adjust his aiming point and fire a second round.

4405. CALLING THE SHOT

In calling the shot, the shooter predicts where the shot will hit on the target. This is done both while snapping-in and firing on the range. The shooter calls the shot by noting where on the target the sights were when the round went off. If he is not calling the shot (i.e., the shot very seldom hits the target where the shooter called it), he may be jerking the trigger or doing something else wrong. This helps both the shooter and the coach detect and correct mistakes. If it is determined that the shooter is controlling the trigger and performing all the other fundamentals correctly and still is not calling the shots, a sight change may be necessary. Calling the shot can also help both the shooter and the coach determine if the elevation and/or windage is correct.

4501. GENERAL

There is no basic difference between rapid and slow fire. Accuracy in both requires each shot to be properly aimed, held steady, and squeezed through. Rapid fire is nothing more than a series of slow fire shots fired with a short time allowance for each. Time is saved and speed is gained by blending the elements of good position, sighting and aiming, trigger control, controlled breathing, and reloading into a smoothly coordinated rhythm or cadence.

4502. RAPID FIRE EXERCISES

The teaching of rapid fire can be accomplished by using three rapid fire exercises: the one-shot exercise, reloading exercise, and the 10-shot exercise. These exercises are best taught utilizing the coach-pupil method when either dry or live firing.

a. One-Shot Exercise.--In the one-shot exercise, the shooter must be able to assume a position rapidly and fire the first shot. The shooter first assumes his regular position and adjusts his natural point of aim onto the target. When satisfied with his position, he marks the position of his crotch or buttocks (sitting) or his left elbow (prone) to facilitate retaking the position. The shooter then rises and, on command, retakes his position rapidly using the aforementioned marks as a guide, readjusts his natural point of aim if

necessary, and applies the correct trigger control to fire the shot within the specified time limit (generally 11 seconds for sitting and 12 seconds for prone).

b. Reloading Exercises.--Reloading with the service rifle is time-consuming; however, with practice, it can be accomplished smoothly and with a minimum of wasted time and motion. It must be remembered that the loaded magazine should always be placed in the pouch, ammunition down, bullet forward. When the shooter completes firing the first magazine, he drops the butt of the rifle to the thigh (sitting) or the ground (prone). He reaches forward and with the right hand grasps the magazine. With the thumb, he pushes the magazine catch to the left and, with the remaining three fingers, pulls straight down on the magazine and places the unloaded magazine on the ground. Reaching to the rear, he removes the loaded magazine from the pouch, inverts it with a simple twist of the wrist, inserts the magazine straight up into the magazine well, and pushes sharply upward ensuring the magazine is latched. The shooter then reaches over the top of the receiver and depresses the bolt stop release lever with the thumb of the firing hand. This releases the bolt allowing it to move forward to chamber the top round. A sharp push on the forward assist assembly will ensure the bolt is locked and permit the rifle to fire. Practicing this procedure will develop good timing, confidence, and proper technique. The above technique provides for the least motion possible.

c. 10-Shot Exercise.--This exercise can only be accomplished through live firing. There

RAPID FIRE CADENCE 200 & 300 YARDS												
ROUND NO.	1	2	3	4	5	6	7	8	9	10	X	X
SECONDS	12	16	20	24	28	42	46	50	54	58	2	60

8 Seconds Take Position
4 Seconds Cadence
10 Seconds Reload
2 Seconds Buffer

Figure 4-47.--Rapid Fire Cadence.

is no acceptable method to cock the rifle, without a radical move on the part of the shooter, to practice this exercise on the dry firing range. In live firing, it is important for the shooter to establish a definite cadence of firing the required number of rounds within a specified time limit. (See fig. 4-47.) NOTE: It is not mandatory for the shooter to fire at the exact cadence specified. The chart simply represents the most economical use of available time.

Section VI. SIGHT ADJUSTMENT

4601. GENERAL

Following training in fundamentals, the Marine must zero his service rifle. To accomplish this, he must first learn the operation of both front and rear sights, the use of the elevation and windage rule, and how to compute sight changes. The sights on the M16A1 rifle are adjustable for both elevation and windage; however, windage adjustments are made on the rear sight and elevation adjustments on the front sight.

4602. SIGHTS

a. Rear Sight.--The rear sight (see figs. 4-48 and 4-49) consists of two apertures and a windage drum with a spring-loaded drum with a spring-loaded stud. The unmarked aperture is used for targets at ranges from 0-300 meters. The aperture marked "L" is used to engage targets in excess of 300 meters. Windage adjustments are made by pressing in on the spring-loaded stud with a pointed object (such as a bullet tip) and rotating the windage drum in the direction desired to move the strike of the bullet. A clockwise movement of one click moves the strike of the bullet to the right 2.8 centimeters for each 100 meters of range. There are approximately 34 clicks of windage on the windage drum.

b. Front Sight.--The front sight (see fig. 4-50) consists of a post and spring-loaded

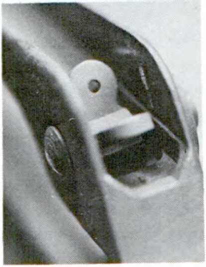


Figure 4-48.--Rear Sight.

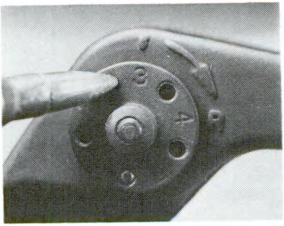


Figure 4-49.--Windage Drum.

Figure 4-50.--Front Sight.

stud. The spring-loaded stud must be depressed with a pointed object (tip of a bullet) to allow the sight post to be rotated in the desired direction to raise or lower the strike of the bullet on the target. Moving the sight post in the direction of the arrow marked "UP" will raise the strike of the bullet up. Each click the post is rotated moves the strike of the bullet 2.8 centimeters for each 100 meters of range.

c. Mechanical Zero (MZ).--Prior to the adoption of the M16A1 rifle, the sights on service weapons were marked with index lines which allowed a ready reference to the sights position. However, the sights on the M16A1 are not indexed, requiring a system to be established which will standardize setting the mechanical zero through out the Marine Corps. By standardizing this procedure, all Marines will be once again speaking the same language. The steps outlined below should be accomplished during the preparatory marksmanship training week, prior to firing.

(1) Front Sight MZ.--Adjust the front sight post until the base of the post is exactly flush with front sight post housing. (See fig. 4-51.) When this is accomplished, mark the sight and housing with paint or fingernail polish. (See fig. 4-52.) The front sight is now set at mechanical zero. SPECIAL NOTE: Inspect the front sight post closely. If the post is bent, have it replaced before accomplishing the above. Do not attempt qualification firing with a bent front sight post. Any elevation adjustments will also affect the windage.

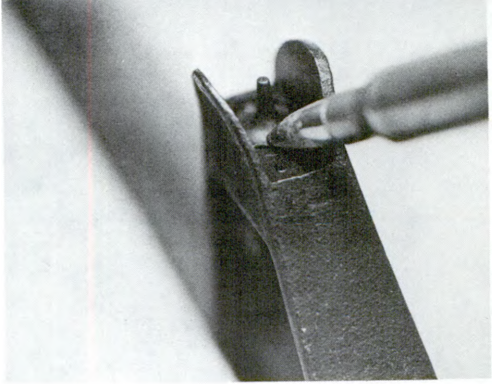


Figure 4-51.--Front Sight Post Flush With Housing.

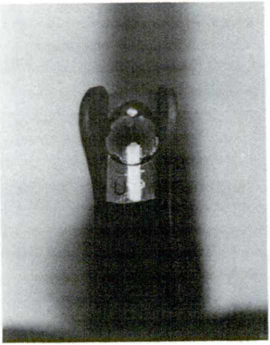


Figure 4-52.--Marking Front Sight.

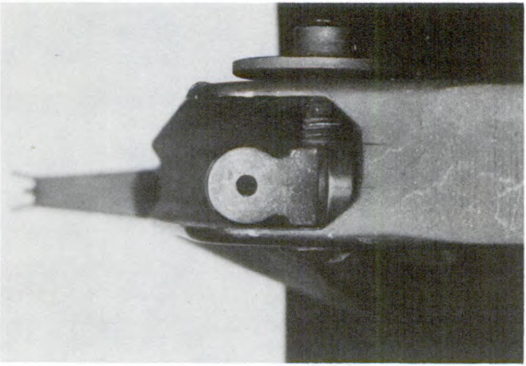


Figure 4-53.--Marking Rear Sight Apertures.

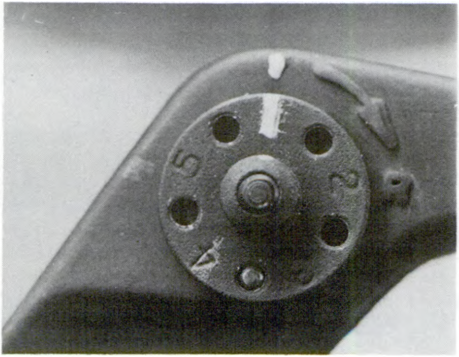


Figure 4-54.--Marking Windage Drum.

(2) Rear Sight MZ.--There is no reasonable accurate method to index the rear sight aperture. Therefore, the left-most position of the aperture will become the rear sight mechanical zero. (See fig. 4-53.) While the rear sight aperture is at its left-most position, mark the windage drum (at nearest click to left-most position) near the 12 o'clock position to align with the index mark on the carrying handle. (See fig. 4-54.)

d. Initial Sight Setting.--After establishing the MZ for the front and rear sights, the initial settings for zeroing should be 12 clicks of elevation on the front sight and 17 clicks to the right on the rear sight.

(1) During preparatory marksmanship training, all dry firing exercises should be conducted with the sight setting described in subparagraph d. above.

(2) The basic principles of zeroing are described in paragraph 4801.

(3) The basic principles for the application of battlesights are described in paragraph 6204.

4603. ELEVATION AND WINDAGE RULE

One click of elevation or windage will move the strike of the bullet 2.8 centimeters on the target for each 100 meters of range, or approximately 1 inch (2.54 centimeters equals 1 inch). For the sake of simplicity, it can be considered that the elevation and windage rule is virtually the same for distances measured in yards or meters up to the maximum

effective range of the rifle: at 500 yards, one click moves the strike of the bullet 5 inches; at 500 meters, 5½ inches. Therefore, it can be stated that one click of elevation or windage will move the strike of the bullet approximately 1 inch for each 100 yards/meters of range.

4604. SIGHT CHANGES

To make sight changes, the shooter first locates the center of his shot group and then determines the distance between it and the desired location. The distance in elevation is determined vertically, while distance in the windage is determined horizontally. These distances are converted to clicks by using the elevation and windage rule. As a general rule, bold adjustments will prove more advantageous to the shooter. For example, if the shooter cannot decide whether to move two or three clicks, he should normally make the adjustment requiring the greater number of clicks. To raise the strike of the bullet, the shooter must rotate the front sight post in the direction of the arrow marked "UP" (stamped on the front sight base); thus, the strike of the bullet is raised. Reverse the direction of rotation to move the strike of the bullet down. To move the strike of the bullet to the right, rotate the windage drum the desired amount of clicks clockwise, in the direction of the "R," right. Reverse the direction of rotation to move the strike of the bullet to the left.

4701. GENERAL

In the case of a highly trained Marine rifleman, effects of the weather are a primary cause of error in the strike of the bullet. The wind, light, temperature, and humidity all have some effect on the bullet, the shooter, or both. Some of these effects such as temperature and humidity are relatively insignificant, since most shooting is done under average conditions. However, shooting is sometimes done under extremes of such effects, so their effects must be explained along with the effects of wind and light.

4702. EFFECTS OF WIND

The condition which constantly presents the greatest problem to the shooter is the wind. Wind has a considerable effect on the bullet, and it increases with the range. Wind also has a considerable effect on the shooter, particularly in the standing position. The stronger the wind, the more difficulty he has in holding the rifle steady. The effect can be partially offset with good training and conditioning.

a. Classification of Winds.--Winds are classified according to the direction from which they are blowing in relation to the direction of fire. The "clock system" (see fig. 4-55) is used to indicate this direction. A wind blowing from right to left directly across the shooter's front is called a "3 o'clock wind."

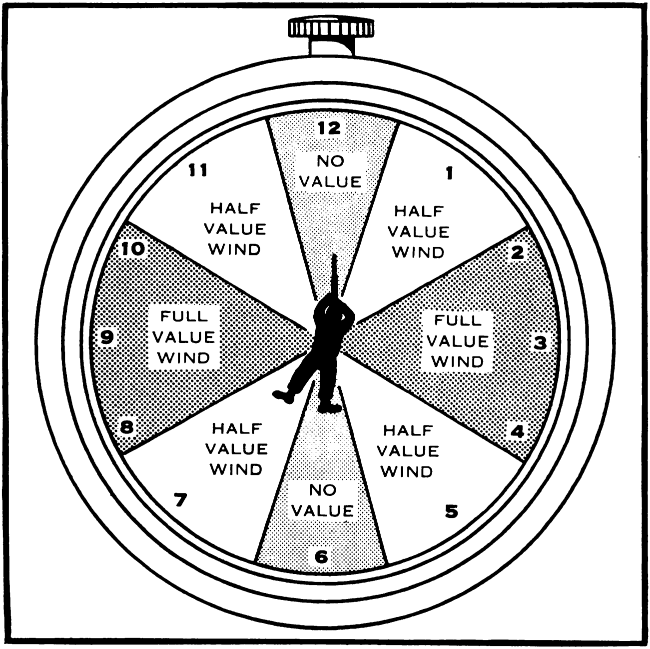


Figure 4-55.--Wind Direction by the Clock System.

A wind blowing toward the shooter from his left front is called an "11 o'clock wind." The direction from which the wind is blowing also denotes the value of the wind. Winds from either flank are "full value winds," those from the

oblique are "half value winds," and winds blowing from either the front or rear are "no value winds." A half value wind will effect the bullet approximately half as much as a full value wind. That is, a 1 o'clock wind having a velocity of 10 miles per hour is equivalent to a 5-mile per hour 3 o'clock wind. For basic firing, the effect of a no value wind on the bullet is negligible and may be discounted.

b. Wind Velocity.--There are three common field expedient methods of determining

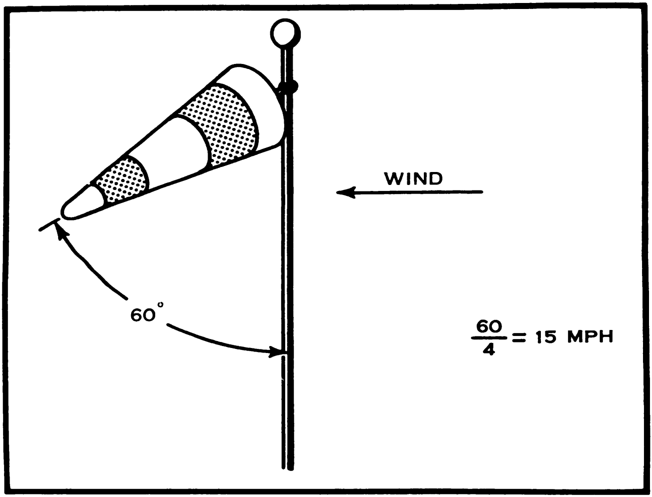


Figure 4-56.--Determining Wind Velocity by the Flag Method.

wind velocities. Since the tactical situation may limit the use of some methods, Marines must be thoroughly familiar with all techniques.

(1) Flag Method.--(See fig. 4-56.) If a shooter can observe a flag (or any cloth-like material similar to a flag) hanging from a pole, he should estimate the angle (in degrees) formed at the juncture of the flag and the pole. Dividing this angle by the constant number "4" will give the wind velocity in miles per hour.

(2) Pointing Method.--(See fig. 4-57.) If no flag is visible, a piece of paper or other light material may be dropped from the shoulder. By pointing directly at the spot where it lands, the angle (in degrees) can be estimated. This figure is also divided by the number "4" to determine the approximate wind velocity in miles per hour.

(3) Observation Method.--If the tactical situation prevents the use of the above

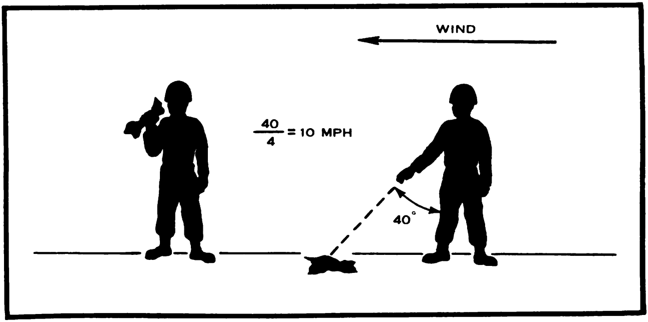


Figure 4-57.--Determining Wind Velocity by the Pointing Method.

two methods, shooters can use the following information in determining wind velocities:

(a) Under 3 miles per hour, winds can hardly be felt, but the presence of slight wind can be determined by drifting smoke.

(b) A 3- to 5-mile per hour wind can be felt lightly on the face.

(c) Winds of 5 to 8 miles per hour keep tree leaves in constant motion.

(d) At 8 to 12 miles per hour, winds will raise dust and loose paper.

(e) A 12- to 15-mile per hour wind will cause small trees to sway.

c. Determination of Windage Adjustment. --After finding the wind direction and velocity, the windage correction to be placed on the rear sight is determined by the formula: RxV/10 = number of clicks of windage to be placed on the rear sight for a full value wind. (The mathematically correct formula is RxV/8.1. Due to the variable accuracy of rifles and ammunition, the capability of individual shooters, and to facilitate ease of use; RxV/10 is used.) In this formula, R = range in hundreds of yards/meters, V = velocity in miles per hour, and the number 10 is constant. For half value winds, divide the answer by 2. In placing the computed adjustment on the rear sight, THE REAR SIGHT APERTURE MUST ALWAYS BE MOVED INTO THE WIND. That is, for winds blowing from 12:30 through 5:30, the rear sight aperture must be moved to the right. Conversely, the rear sight aperture must be moved to the left for winds blowing from 6:30 to 11:30. An example of computing a windage adjustment is as follows: a 10-mile per hour wind is blowing from 9 o'clock. The range to the

target is 500 meters/500 yards. Converting this information for use in the wind formula, R=5 and V=10; therefore, RxV/10 = 5x10/10 = 50/10 = 5 clicks (left windage). To place this adjustment on the sight, the windage knob is turned 5 clicks to the rear (counterclockwise), moving the rear sight aperture 5 clicks to the left or into the wind.

d. Wind Deflection.--Due to the very high initial velocity of the 5.56mm bullet, the wind deflection per 1 mile per hour of wind is minimal at ranges up to 300 meters/yards. However, the light weight of the projectile (55 grains) causes it to lose momentum and to drop off very rapidly in velocity past 300 meters. Due to this rapid fall-off, the bullet is adversely affected by the wind, causing the deflection of the bullet to nearly double for each succeeding 100 meters of range. Since the great majority of Marine Corps ranges are in yards, rather than meters, the windage deflection figures are illustrated in yards. (See fig. 4-58.)

(1) Since a 1-mile-an-hour wind is barely perceptible, and even the lightest wind felt and causing even a slight movement of vegetation and/or range flags should be rated at least 5 miles per hour, the deflection in inches and the correction in clicks that should be used on the M16A1 for every 5 miles an hour of wind blowing directly across the range are shown in figure 4-59.

(2) A ready reference for windage values for the 5.56mm cartridge are illustrated in figure 4-60. Bu knowing the velocity of the wind and its direction, the nearest click value is shown.

100 yards	=	.10	inches
200 yards	=	.43	inches
300 yards	=	1.03	inches
400 yards	=	1.97	inches
500 yards	=	3.32	inches

Figure 4-58.--Approximate Distance a 1-Mile-Per-Hour Wind Coming Directly Across the Range (3 or 9 o'clock) Will Move the Projectile From Its Normal Path of Flight.

RANGE (YARDS)	DEFLECTION (INCHES)	CLICKS
100	.51	0
200	2.17	1
300	5.19	2
400	9.88	2-3
500	16.61	3

Figure 4-59.--Deflection and Correction Used on the M16A1 for 5-Mile-Per-Hour Wind.

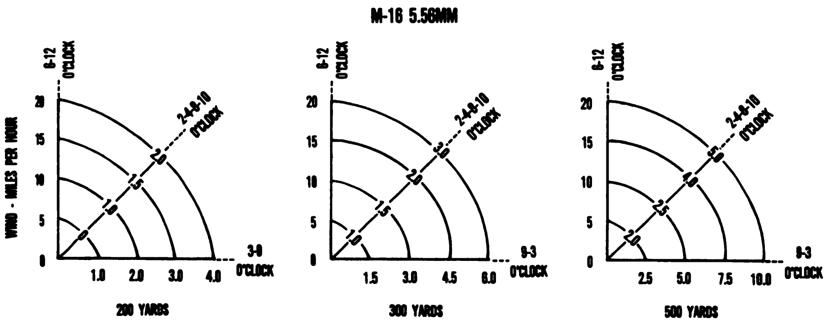


Figure 4-60.--Windage Reference Chart.

4801. PRINCIPLES OF ZEROING

a. Bullet Path and Point of Aim.--To understand the principles of zeroing, the Marine should have a basic knowledge of the relationship between the path of the bullet in flight and the line of sight. In flight, a bullet does not follow a straight line but travels in a curve or arc which is called trajectory. (See fig. 4-61.) The maximum height of a bullet's trajectory depends on the range to the target. The greater the distance a bullet travels before impact, the higher it must travel in its trajectory. On the other hand, the line of sight is a straight line from the eye through the rear sight aperture, across the front sight, to the aiming point or target. So it follows that after the bullet leaves the rifle, it is initially moving in an upward path, intersecting the line of sight. As the bullet travels farther, it begins to drop and will eventually again intersect the line of sight. The range at which this intersection occurs is the zero for that sight setting.

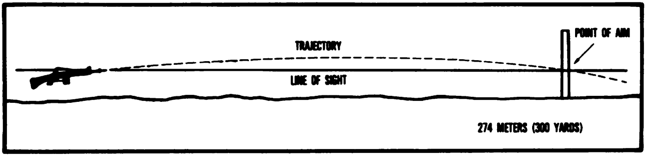


Figure 4-61.--Trajectory of a Bullet.

b. Definition of Zero.--The zero of a rifle is the sight setting in elevation and windage required to place a shot, or the center of a shot group, in the center of the target at a given range when no wind is blowing. Experience has shown that the best way to zero a rifle is to shoot it at the position, range, and cadence at which we intend to use it.

c. Battlesight Zero.--Current doctrine of the United States Marine Corps prescribes a battlesight zero for 274 meters (300 yards). That is, the sights of the rifle should be so adjusted that the trajectory of the bullet and the line of aim intersect at a range of 274 meters. Battlesight zero is a predetermined sight setting that, carried on the weapon, will enable the shooter to engage targets effectively at battle ranges when conditions do not permit exact sight settings. When engaging targets up to 300 yards/meters, use the short range aperture. Flip the "L" or long range aperture up to engage targets beyond 300 yards/meters.

4802. METHOD OF ZEROING

The method of zeroing described in this paragraph will establish an accurate zero providing all shots are recorded in the data book, and provided the information in the data book is used in projecting zero changes. Also, the wind must be taken in consideration in determining windage zero. For example, if the wind velocity required three clicks right windage, the windage zero on the sight will be three clicks left of that used in hitting the center of the target.

a. 183-Meter (200-Yard) Line. The initial zeroing phase should start at the 183-meter (200-yard) line with 12 clicks of elevation on the front sight and 17 clicks right on the rear sight. All references to the windage zero will be a single number which will be the number of clicks from the leftmost position of the rear sight aperture. No attempt should be made to record a windage zero as a certain number of clicks right or left of the center position. While firing for zero, using the procedures outlined in this paragraph, all sight changes are recorded as they are made. Elevation--initial setting--is 12 clicks. If the shots are determined to be 3 clicks low, then the elevation recorded as used for the succeeding shots will be 15, or if 3 clicks high, the elevation would be recorded as 9 for the succeeding shots. Windage will be recorded as a single number from 0 to 34. While starting with a windage setting of 17, if the initial shots are determined to be 5 clicks to the left, then the windage recorded for the succeeding shots would be 22; if 4 clicks to the right, the windage would be recorded as 13 for the succeeding shots. Elevation and windage zeros should be recorded in the data book as 13/18 or 10/12. The left number is elevation and the right number is windage. Be sure to flip the rear sight down to ranges below 300 yards. To facilitate determining the 183-meter zero quickly, it is suggested that the rounds be fired slow-fire in the sitting position. When the slow-fire shots are striking near the center of the target, three three-round shot groups are fired in rapid-fire cadence, followed by a rapid-fire string of 10. During this firing, sight changes are

made to bring the group into the center of the target. If the windage zero is less than 11 or more than 23 clicks from mechanical zero, it will be necessary for the rifle to be adjusted at the armory. The procedure for correcting excessive windage cannot normally be accomplished on the firing line. Often, the rapid-fire zero will be different from the slow-fire zero. This is due to a difference in position and trigger control. Therefore, it is necessary to establish a slow-fire zero. To do this, simply fire several rounds slow-fire from the appropriate position and call each shot accurately. When the shots appear on the target "on call," then the slow-fire zero is obtained; use the 6 o'clock aiming point.

b. 274-Meter (300-Yard) and 460-Meter (500-Yard) Lines.--The 274-meter slow-fire and rapid-fire zero is determined by firing the same exercises as were fired at the 183-meter line, using the center-hold; while at 460 meters, single shots are fired until the group is centered in the target. With the weapon zeroed for 274 meters (300 yards), flip the long-range aperture to "L" and hold in the neck or chest area of the silhouette. The shooter will fire single shots until the group is centered in the target. This will establish a 460-meter/500-yard zero. For aiming points, see figure 4-2. Using this zeroing procedure will work for 80 percent or higher of the shooters and greatly reduce the need for sight manipulations for elevation. Approximately 10 to 20 percent of the shooters may require elevation to be added for 500-yard line firing. This normally is

three to four additional clicks added to the 300-yard elevation. SPECIAL NOTE: Coaches must ensure the sights are adjusted to the 200-yard setting immediately upon the shooter completing the 500-yard stage. This will set the proper sight setting for the next day's shooting. Shooters should be cautioned not to change this setting without informing the coach.

4803. FIELD EXPEDIENT ZEROING

a. General.--Every rifleman, to be effective and accurate, must know the battlesight zero of his rifle when he fires it. Determining battlesight zero on the weapon is normally obtained at the rifle range. However, there is a requirement for the unit commanders to have a method to determine the battlesight zero of the Marine's weapon when rifle range facilities are not available. The exchanging, repairing, or issuing of a different weapon to a Marine demands that the battlesight zero be determined. This can be accomplished on a limited range.

b. Limited Range Zeroing (Battlesight Zero).--Line of sight is a horizontal plane from the shooter's eye to the target. With the correct elevation and windage adjustments on the rifle to hit a target at 274 meters (300 yards), the trajectory of the bullet passes below the line of sight approximately 2.4 centimeters (.8 inches) at 25 meters (1,000 inches) and passes through the line of sight at approximately 34.08 meters. (See fig. 4-62.) Therefore, a shooter may obtain a relative battlesight zero by firing at a target located 25 meters or 34.08 meters from his position as follows:

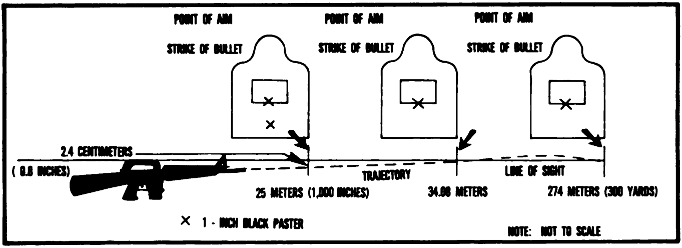


Figure 4-62.--25-Meter and 34.08-Meter Zeroing.

(1) <u>25-Meter Field Expedient</u>.--The standard 25-meter target (see fig. 54), 4-63), or a field expedient target produced locally, can be used when setting battlesights for the M16A1 on a limiked distance or limited facilities range. The M16A1 can be sighted in at 1,000 inches (slightly more than 25 meters) using the same point of impact on the target. This is possible due to the unusually flat trajectory of the 5.56mm cartridge (less than 1/2 inch at 100 yards). In order to use the elevation and windage rule effectively, the shooter must know the dimensions of the squares on the target. Vertical and horizontal lines are printed on the target, forming 1/2-inch (1.4-centimeter) squares. One click of elevation or windage will move the strike of the bullet 1/4 inch (.7 centimeters) at a range of 25 yards. Thus, two clicks of elevation or windage will move the strike of the bullet one square. The 300-yard (274-meter) zero is determined by firing a series of three-round groups at the target

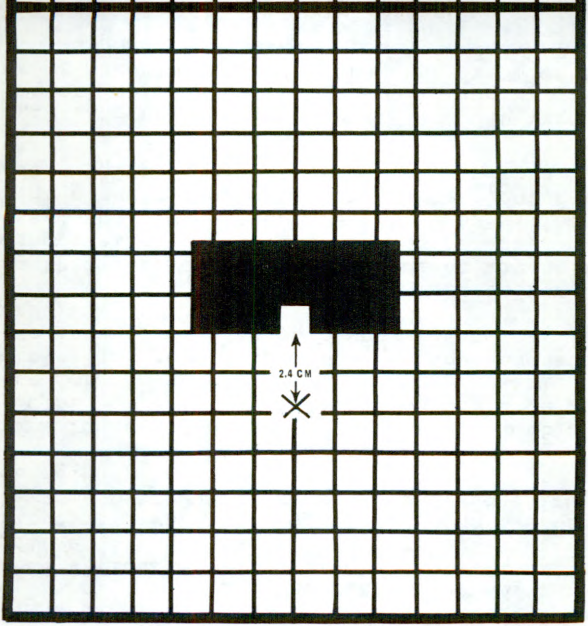


Figure 4-63.--Modified 25-Meter (1,000-Inch
Target (Not to Scale).

described above. The shooter aims at the distinctive aiming point at the bottom center of the black rectangle (base of the white cutaway portion) and adjusts his sights until the center of the three-round group is located .8 inch (2.25 centimers) directly below the aiming point.

(2) 34.08-Meter Field Expedient.--With the target placed at this range, the elevation required to hit the aiming point is the battlesight zero. The disadvantage to this method is that the bullet holes erase the aiming point. Firing is conducted as follows:

(a) A target is set up at 34.08 meters in front of the firing line. A black paster or any method to make a 1-inch square may be used for the aiming point.

(b) The shooter puts 12 clicks (average) of elevation and 17 clicks right windage on his weapon prior to approaching the firing line.

(c) The first round of a three-round string, fired as single shots, is fired and the hit checked. If corrections are required, the shooter adjusts the sights. Use the same procedure for the second and third rounds.

(d) The shooter fires a second three-round group to prove his sight setting. SPECIAL NOTE: Always use the short-range aperture for the above two methods of obtaining the battlesight zero. The "L" or long-range aperture is used for ranges beyond 274 meters (300 yards).

(e) Targets.--Targets for firing this particular field expedient may be made using available material such as "C" ration boxes, etc. The target must have an aiming point clearly marked to enable the shooter to have a point of aim for the impact of the bullet.

4804. BATTLEFIELD ZEROING

Marines should not be sent into combat with weapons that have not been zeroed. Rifles

will not hold a zero indefinitely. Combat conditions and normal preventive maintenance require that rifles be rezeroed.

a. Embarkation.--All commanders are aware of the requirement to zero weapons prior to embarkation. There is little likelihood this important phase of training will be forgotten. However, unit leaders should regard this phase as the first of many.

b. Complacency.--In the hectic atmosphere of combat, the rezeroing of rifles can easily be given a low priority. As with many other areas, command attention will solve this problem. Weapons repair/replacement, severe treatment, and incoming replacements will all compound the problem. Since the effect of rifle fire depends upon the number of hits made, not upon the number of shots fired, it follows that troops who cannot hit what they are shooting at are of little value on the field of battle.

c. Requirements.--Unit commanders must establish the requirements to correct this continuing deficiency. Several areas for the commander to consider are listed below.

(1) Training.--Even on the battlefield, training must continue. One of these areas must be marksmanship and the maintenance of zeros on the weapons. Shooting into a dirt bank only accomplishes familiarization firing. This type of training will not accomplish the objective. Only practice firing at hitting the mark, as detailed in paragraph 3803, will satisfy this requirement. Time permitting,

training should not be held to a specific number of rounds.

(2) Methods.--There are three distances that can be used to zero the M16A1 rifle. The best is to use a known distance range having a 274-meter line with appropriate targets. However, most units in combat areas will not have a known distance range available. The use of a 25-meter range will accomplish the desired results and can be established any place near the unit's position. (See par. 3803b.) The third method is using a distance of 34.08 meters and adjusting the sights for point of aim/point of impact. The one disadvantage is firing at this range will wipe out the aiming point and require more targets.

(3) Positive Procedures.--Commanders must ensure that their instructors are knowledgeable and maintain the set training plan and that individual Marines maintain a record of their zeros or new zeros each time they fire. Small unit leaders must ensure that the sights are properly adjusted at all times. Commanders should set specific procedures to maintain the proper battlesight zero.

(4) Frequency of Zeroing.--Replacement Marines should zero immediately. Any Marine issued a different rifle or having work done to his rifle should zero in before departing on any mission or taking a position on the line. As a minimum requirement, each Marine should rezero monthly. Once a week is the optimum.

(5) Targets.--The easiest method to ensure that targets are always available is to make a template consistent with the 25-meter zeroing target. (See fig. 4-63.) The template

will have the aiming point and the desired point of impact for 25-meter firing. Once the template is made, any paper may be used for the target. Ammunition crates may be used, but wood's tendency to splinter easily makes them the least desirable.

Section IX. DATA BOOK

4901. GENERAL

Of all the "tools" available to assist a shooter in obtaining a good score on the rifle range, the data book, if filled in correctly, is his most valuable asset. It contains a record of every shot fired by the individual as well as weather conditions and their effects on the shooter. If used properly, it will provide the necessary information for initial sight settings at each range. It provides a basis for analyzing the performance of the shooter and his rifle, and is a valuable aid in making bold and accurate sight changes. Instruction in the use of the data book must be given prior to firing any rounds in zeroing or practice. This instruction should be integrated with the instruction on effects of weather, since these subjects are interrelated. Although this instruction is not directly concerned with the individual's skill in applying the fundamentals of marksmanship, it is a vital phase of training to the Marine marksman. The most competent rifleman cannot consistently hit the center of the target unless he can analyze his performance, has a record of his performance, or has a record of the conditions that affect his shooting.

4902. USE OF THE DATA BOOK

When the shooter is first issued a data book, pertinent information such as name, organization, rifle number, and date issued should be listed on the front cover. This will facilitate

recovery should it be misplaced. Secondly, for quick reference, information as to windage and elevation zero for various ranges should be marked on the zero data card and the front cover of the data book.

a. Slow Fire.--The following procedure should be used for filling out and maintaining the data book in slow fire:

(1) Before Firing.--Before firing, the date, wind direction and velocity, starting elevation, and windage zero should be entered. Other appropriate notations should be made in the space for remarks; i.e., wind gusty, scattered clouds, misting rain, etc. All information that will aid the shooter to remember that string of fire and proper analysis of his performance should be entered in the spaces provided in the remarks block.

(2) During Firing.--A strict sequence of recording data during firing must be followed:

(a) If a wind is blowing, the value is determined and set on the sights and entered in the data book.

(b) After firing each round, the call is plotted.

(c) While the target is being marked, the shot just fired is called, the previous shot is plotted with the appropriate score and compared with the appropriate call.

(d) The correct sight setting determined from analyzing the group is then recorded.

(e) Do not be concerned with marking the value of shots during firing. If the calls have been plotted and the shots have

been plotted, correctly, the value of the shots may be entered later. The important point to remember is that you must be able to analyze what has been done. If the calls, shots, and sight changes are not recorded properly, the values then serve no purpose.

(3) After Firing.--Upon completion of firing, the results should be analyzed and studied very carefully.

b. Rapid Fire.--The following procedure should be used for filling out and maintaining the scorebook in rapid fire:

(1) Before Firing.--Before firing, the shooter records the same information as he did for slow fire.

(2) During Firing.--In rapid fire, the sequence to be followed during firing is different than that of slow fire:

(a) The final windage correction, if needed, is made shortly before the targets appear, and this is applied to the sights. While firing, a mental note is made of any shots called out of the group.

(b) Indicate in the remarks block any shots called out of the group and the reason. Example: #3 jerked 5 o'clock; #8 flinched 10 o'clock. In this manner, you have a record of those shots that should appear out of the group.

(c) When the target is marked, all visible hits are plotted with an "X" and compared to the calls.

(d) The correct sight setting or aiming point is determined by analyzing the group and then recorded conspicuously.

(3) <u>After Firing</u>.--Upon completion of firing, the results should be analyzed and studied very carefully.

(a) After completion of firing, information recorded during each stage of firing for each day, such as correct windage and elevation used, weather conditions during time of firing, and any pertinent data for that particular day, should be recorded on the rifle data sheets in the front section of the data book.

(b) By proper utilization of these sheets, a shooter can maintain an accurate record, on a day-to-day basis, of the various conditions and windage and elevation used during his practice week. When "record day" arrives, he can then scan through his data sheets to locate that sheet which contains information paralleling the conditions prevailing on the day he is to qualify.

c. <u>Target Analysis</u>.--Target or shot group analysis is an important step in the process of detection and correction of errors. As the target appears, critique and correlate errors in performance to scattered groups, shape of groups, and size of groups. Following are descriptions of typical shot groups which are the result of probable errors. Reverse the directions for left-handed shooters:

(1) <u>Group Strung Low and Right</u>.--Probable errors:

(a) Prone: Left elbow not under the rifle (or as nearly so as possible), loose sling, or the right elbow slipping.

(b) Sitting: Right elbow slipping, or left elbow slipping down the left leg.

(c) May be caused by improper trigger control in both positions.

(2) Group Scattered About Bull's-Eye.--Probable errors are incorrect sight alignment or sight picture, eye focused on bull's-eye, changing the stock weld, or a loose position.

(3) Group With Several Erratic Shots.--Probable errors:

(a) Flinching: Shots may be anywhere.

(b) Bucking: Shots from 7 to 10 o'clock.

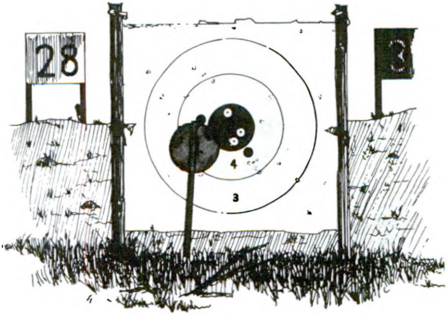
(c) Jerking: Shots may be anywhere.

(4) Group Strung Up and Down Through Bull's-Eye.--Probable errors are breathing while firing, improper vertical alignment of sights, or changing the stock weld.

(5) Compact Group Out of Bull's Eye.--Probable errors are incorrect zero, failure to compensate for wind, position and natural point of aim incorrect, or improper sight adjustments.

(6) Group From Center to Bottom of Frame.--Probable errors are sling sliding down arm, too low a position, or change in position of rifle in shoulder after reloading.

(7) Horizontal Group.--Probable errors are incorrect sight alignment, canting rifle, loose position, or "muscling" rifle.



CHAPTER 5

KNOWN-DISTANCE RANGE FIRING

Section I. INFORMATION

5101. GENERAL

As the M16A1 has both a semiautomatic and automatic capability, it is necessary to ensure that personnel armed with the rifle have a high level of proficiency in employing the weapon in both roles. Emphasis must be maintained on training the individual to gain hits on his target using the rifle in its semiautomatic configuration. This chapter limits itself to discussion of marksmanship on known-distance ranges with the rifle in its semiautomatic role only. Information on field firing and employing the weapon in its automatic role is found in FMFM 1-3A, Field Firing Techniques.

5102. PURPOSE

The known-distance range is an extremely important phase in the building of a sound foundation of marksmanship principles. It would be impossible to eliminate this second phase of marksmanship training and still expect the training progression to produce a rifleman with the degree of proficiency identifiable with and required by the Marine. It is during this phase that the rifleman acquires the elementary skills necessary to perform well on any firing range. After thorough instruction in the fundamentals of marksmanship, the Marine is given the opportunity to apply those principles under close supervision. Through continual proper application of the principles taught during the preparatory phase, the foundation of sound marksmanship principles is constructed in each Marine. With the understanding of marksmanship principles and the successful completion of the application phase of those principles, the rifleman is then ready to progress to any phase of marksmanship training which requires accurate, well-aimed fire.

5103. TRAINING

Known-distance range firing is nothing more than a practical application phase of those fundamental skills taught during preparatory marksmanship. It is the opportunity for the individual rifleman to put into practice the integrated act of shooting. Under the guidance of his coaches, the rifleman is taught to understand the elements that affect the hitting or missing of a target by analyzing his own experiences in firing his rifle. On the known-distance

range, the rifleman will actually engage targets up to the maximum effective range of his rifle. During this training, he will come to appreciate the various skills that he must master to enable him to deliver accurate fire at a point target and will be building confidence within himself. Known-distance range training will be conducted in accordance with current Marine Corps directives. Appendix B contains a breakdown of the course of fire for the known-distance course.

Section II. COURSES OF FIRE

5201. GENERAL

The types of firing courses set forth in current Marine Corps directives are established to provide standardized rifle training throughout the Marine Corps and to provide an adequate means of evaluating the capabilities of riflemen. Therefore, in establishing a known-distance range course of fire, there are certain criteria that should be met to be an effective course:

a. Several Distances.--The rifleman should fire at several different ranges up to the maximum effective range of his rifle. This is necessary to teach the shooter the effects of wind on a bullet at various ranges and that he learn how to manipulate the sights in moving from one distance to another. It will also instill within the rifleman the confidence and knowledge that he can effectively engage a target at great distances.

b. Basic Positions.--The course of fire should require the rifleman to utilize all four of the basic positions taught in the preparatory phase of marksmanship training. All combat or field positions are variations of the prone, sitting, kneeling, and standing or offhand positions.

c. Slow and Rapid Fire.--During the conduct of firing, the rifleman should be required to fire both slow and rapid fire stages. The slow fire stages allow both the coach and

the rifleman to analyze each round to determine the reason for each hit or miss. It is necessary to learn to deliver one well-aimed round since rapid fire is nothing more than a sequence of individual well-aimed rounds. During rapid fire, the rifleman is required to deliver an accurate volume of fire at specific targets. He should also be required to reload his rifle within the string of fire as an additional training feature.

d. Record Day.--Known-distance firing should consist of both instructional and record firing. Instructional firing is practice firing with the assistance of coaches. Record firing is done without the assistance of coaches, and it is used to evaluate the rifleman's ability in applying the fundamentals of marksmanship. The requirement of record firing also creates additional pressure or anxiety on the rifleman which he must control to satisfactorily complete the course of fire. As a general rule, instructional firing is completed before any portion of record firing is started. No part of record firing should be conducted on the same day with instructional firing unless scheduling difficulties require it. A record firing once begun shall be carried to completion except under the most unusual circumstances not under the control of the personnel being tested. An interrupted record firing shall be continued from the point at which the interruption occurred. No additional practice or sighting shots will be permitted unless sighting shots are prescribed as a regular part of the record qualification.

CHAPTER 6

FIELD RANGE FIRING

Section I. GENERAL

6101. PURPOSE

Field range firing is the third phase of progressive marksmanship training. It is during this phase that the rifleman is provided with practical experience in firing at realistic targets located at ranges comparable to those of the battlefield. Not only does the rifleman have the opportunity to fire a field range course, but more importantly, he receives instruction in basic field firing techniques. Phase three is nothing more than a transition from the fundamentals learned on the known-distance range to their application in the field. Although field range firing is primarily designed to teach skills which cannot be effectively conducted on the known-distance range, the fundamentals learned during

this earlier training phase must continue to be emphasized.

6102. TRAINING

a. General.--Whenever possible, field range firing should be conducted on field firing ranges constructed for this specific purpose. If such ranges are not available, field firing can be conducted on a modified known-distance range. Even with the required modifications, the firing conducted on the known-distance range is, at best, expedient training and cannot be considered comparable to the benefits gained from training on field firing ranges. Therefore, if there is a need for establishing a priority of range use, the field firing range should be given preference over the modified known-distance range. The techniques that must be taught before a rifleman can be expected to effectively engage a field target are covered in section II of this chapter.

b. Field Range Course.--There are numerous field range courses, depending upon the ingenuity and initiative used, that can be devised to facilitate proper instruction in field firing techniques. Some of the field expedient courses and various target arrays designed to accomplish instruction in the various techniques, both at individual and unit level, can be found in FMFM 1-3A, Field Firing Techniques. A typical field range course is shown in appendix F. This course represents the optimum in field range courses since it requires the application of all the techniques taught during field range training

except individual night firing. Although the typical range shown is not designed for night fire problems, it could be used for that purpose with minor modifications.

Section II. FIELD RANGE FIRING TECHNIQUES

6201. GENERAL

Combat rifle firing is an integrated act involving several techniques and procedures necessary to fire the rifle and hit the target. This means that the techniques used in firing the rifle in combat are applied instinctively and simultaneously. The field range firing techniques covered in this section and in FMFM 1-3A, Field Firing Techniques, are identical to the techniques employed while engaging combat targets on the field of battle. The rifleman will undergo his final exam in field firing techniques when he actually engages a combat target on the battlefield, and the knowledge learned on the field range will assist him in "scoring well."

6202. TARGET DETECTION

a. General.--Even the most skilled marksman is useless if he cannot find the target. Detecting a target can be a greater problem for the combat rifleman than hitting it. Except during the assault, it is a rare enemy who fails to use some cover and/or concealment when he is in the vicinity of Marine units. Consequently, considerable emphasis must be placed on teaching Marines the techniques of detecting targets as they will appear on the battlefield. These targets may be either single or multiple, and either stationary or moving. They may also be completely hidden from view. This paragraph sets forth procedures to enable Marines to better detect the

enemy on the battlefield under varying degrees of mobility and concealment. Initially, target detection training can be covered in two distinct phases: first, how to locate a target; and second, how to remember the location of the target. Later, training in these phases should be combined into practical exercises which test the overall target detection ability of the Marine.

b. Target Location.--Success in locating combat targets will depend upon the observer's position, his skill in searching an area, his maintaining observation over the area, and his ability to recognize indicators presented by the target.

(1) Observer's Position

(a) Selection.--Depending upon the situation, the individual rifleman may or may not select his own position. In most defensive situations, the rifleman is told where to prepare his position. However, there are situations such as the attack and reorganization on the objective, which require the individual to select his own position. Instruction should continuously refer to and emphasize the importance of the observer's position when conducting practical exercises in target detection techniques.

(b) Desirable Characteristics.--A good position is one that offers maximum visibility of the area while affording cover and/or concealment. As used in this case, "position" is both the observer's location on the ground and the position of his body at that location.

(2) Searching the Area

(a) Hasty Search.--When a Marine moves into a new area, he must quickly check for enemy activity which may be of immediate danger to him. This is a very rapid search lasting approximately 30 seconds and known as the hasty visual method of search. This search is conducted by making quick glances at various specific points throughout the area rather than sweeping the eyes across the terrain in one continuous panoramic view. It is effective because the eyes are sensitive to any slight movements occurring within a wide arc of the object on which they are focused. This faculty is commonly called "side vision" or "seeing out of the corner of the eye." However, the eyes MUST be focused on a SPECIFIC POINT in order to have this sensitivity.

(b) Detailed Search.--If the Marine fails to locate the enemy during the hasty search, he must then begin a systematic examination known as the 50-meter overlapping strip method of search. (See fig. 6-1.) Normally, the area nearest the Marine offers the greatest potential danger to him. Therefore, the search should begin with the terrain nearest the observer's position. Beginning at either flank, the Marine should systematically search the terrain to his front in a 180-degree arc, 50 meters in depth. After reaching the opposite flank, the Marine should search the next area nearest his position. This search should cover the terrain located between approximately 40 and 90 meters of his position. The second search of the terrain includes about 10 meters of the area examined during the first search. This technique ensures complete coverage of the area. The Marine continues searching

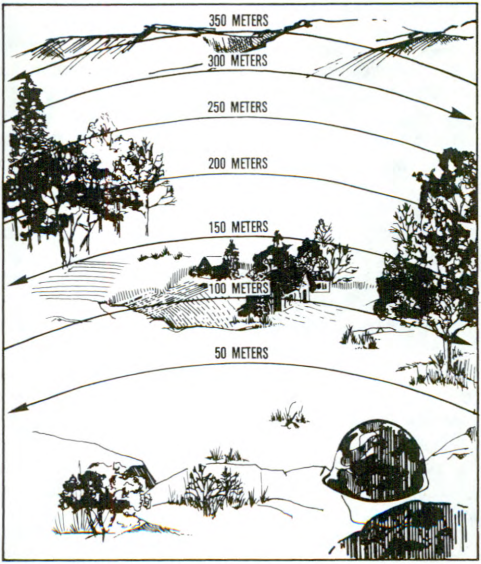


Figure 6-1.--Searching the Terrain in Overlapping Strips.

from one flank to the other in 50-meter overlapping strips as far out as he can see.

(c) Use of Specific Points and Prominent Features.--To again take advantage of his side vision, the Marine should focus his eyes on specific points as he searches from one flank to the other. He should make mental notes of prominent terrain features and areas that may offer cover and/or concealment to the

enemy. In this way, he becomes familiar with the terrain as he searches it.

(3) Maintaining Observation of an Area

(a) Method.--After completing his detailed search, the Marine may be required to maintain observation of the area. To do this, he should use a method similar to his hasty search of the area. That is, he uses quick glances at various points throughout the entire area, focusing his eyes on specific features.

(b) Sequence.--In maintaining observation of the area, he should devise a set sequence of searching the area to ensure complete coverage of all terrain. Since it is entirely possible that this hasty search may fail to detect the initial movement of an enemy, the observer should periodically repeat a detailed search of the area as described in paragraph 5202b(2)(b). This detailed search should also be conducted anytime the attention of the observer has been distracted from his area of responsibility.

(4) Target Indicators.--A target indicator is anything a Marine does or fails to do that will reveal his position to an enemy. Since these indicators apply equally to both sides on the battlefield, a Marine must learn target indicators from the standpoint of locating the enemy, but at the same time, preventing the enemy from using the same indicators to locate him. These indicators are grouped into the three general areas of sound, movement, and improper camouflage.

(a) Sound.--Targets indicated by sounds such as footsteps, coughing, or equipment noises provide only a general location.

Consequently, it is difficult to pinpoint a target's location by sound alone. However, the fact that a sound has alerted an observer greatly increases the possibility that he will eventually locate the target through subsequent target indicators.

(b) Movement.--The degree of difficulty in locating moving targets depends primarily on the speed of movement. Slow, deliberate movements are much more difficult to notice than those which are quick and jerky. The techniques used in the hasty search will provide the best means for locating moving targets.

(c) Improper Camouflage.--The improper use of, or lack of, camouflage and/or concealment provides indicators which reveal the majority of targets detected on the battlefield. Such things as light reflecting from a shiny surface, regularity of outline, and a contrast with the background are indicators easily noticed by an alert observer. Camouflage indicators are divided into the three general groups of shine, regularity of outline, and contrast with background.

1 Shine.--Items such as belt buckles or other metal objects will reflect light and act as a beacon to the wearer's position. This is as true at night as it is during the day. Consequently, objects which reflect light should be camouflaged.

2 Regularity of Outline.--The human body and most types of military equipment are familiar outlines to all Marines. The outlines of such things as rifles, steel helmets, and vehicles are all easily identified. The reliability of this indicator depends upon

the visibility and the experience of the observers. On a clear day, most Marines can easily identify enemy riflemen or equipment if a distinctive outline is presented. At night or during other periods of poor visibility, it is not only more difficult to see outlines, but inexperienced troops will frequently mistake stumps and rocks for enemy riflemen. This is an added reason for Marines to become completely familiar with the terrain during periods of good visibility.

3 Contrast With the Background

a Personnel.--If a Marine wearing a dark uniform moved into a position in front of a snowbank, the contrast between the white snow and the dark uniform would make him clearly visible. However, if he is wearing a white (or light colored) uniform, he will be more difficult to see. Contrast with the background is among the most difficult of the target indicators for a Marine to avoid. The reason for this is that during operations in which the Marine is moving, he is usually exposed to any number of different types and colors of backgrounds. Since there is no one kind of personal camouflage which blends in all areas, a moving Marine must be continually aware of the surrounding terrain and vegetation.

b Prepared Positions.--Contrasts in background are also a common deficiency of defensive positions. A parapet of freshly dug earth around a foxhole is as noticeable as a flag waving over it. Even if the positions are camouflaged, it is still possible to locate them from the very materials used to provide concealment. For example, a hill having no vegetation except a row of evenly

spaced bushes along the military crest leaves little doubt in an observer's mind as to the presence of defensive positions. Even camouflage which blends with the area can indirectly disclose a position. Since camouflage materials are usually cut from vegetation within the immediate vicinity, an observer seeing an area which has been stripped of natural growth can logically deduce the presence of nearby camouflaged emplacements. Another problem of using vegetation for camouflage is that it will eventually wilt and turn brown. This produces a contrast similar to those positions having no camouflage at all.

c. Remembering Target Location

(1) General.--Once a target has been located, the Marine may have to remember its location in relation to some visible feature. There could be several reasons for this. The enemy may have only briefly disclosed his position before disappearing from view. In some situations, the rifleman may be under orders not to fire and disclose his position. Probably, the most common reason is that if the Marine observes several targets at the same moment, he can obviously fire on only one of them at a time. Consequently, he must remember the location of the others until he is ready to engage them.

(2) Techniques.--To remember the location of a target, the Marine uses an aiming point or a reference point. An aiming point is a feature directly on line between the rifleman and the target. For example, if a Marine observes an enemy rifleman moving into a completely concealed position behind a bush, he can select a point of aim on the bush and

should hit the enemy rifleman even though he cannot see him. However, if the enemy rifleman moves into a concealed position which has no distinguishable feature in front of it, the Marine must then select a nearby feature and determine its distance and general direction from the target. It is apparent that an aiming point is usually the more effective means of delivering accurate fire.

(3) Considerations.--The difficulty in using reference points or aiming points to remember the location of targets moving from one place to another will depend on many factors. Included in these factors are:

(a) Number.--When several targets appear and disappear at approximately the same time, it is very difficult to note the point of disappearance of each. Therefore, it is imperative that the observer concentrate on the location of the most prominent targets or he will fail to effectively locate any of them.

(b) Exposure Time.--Usually, moving targets are exposed for only a short period of time. Thus, the observer must be alert to note the point of disappearance for all of the targets. In such situations, the Marine should remember the location of as many targets as possible before engaging any of them. By so doing, he will know the location of several targets and can engage each of them in rapid succession.

(c) Spacing.--The greater the interval between targets, the more difficult it is to note the movements of each. When there is considerable distance between targets, the observer should accurately locate the one nearest his position and note the general area of the others.

(d) Evaluation of Aiming Points.--Targets disappearing behind good aiming points can be easily remembered for future reference. On the other hand, targets disappearing behind poor aiming points are difficult to locate accurately and are easily lost. If two targets offer about the same degree of danger to the Marine, but one disappears behind a good aiming point and the other behind a poor aiming point, the Marine should note the location of the target behind the good aiming point and engage the other target first.

6203. RANGE ESTIMATION

a. General.--Simply stated, range estimation is the process of determining the distance between two points. In most situations, one of these points will be the observer's own position. The other point may be a target or prominent feature. THE ABILITY TO ACCURATELY DETERMINE RANGE IS A KEY SKILL NEEDED BY THE COMBAT RIFLEMAN TO ACCOMPLISH HIS MISSION. Not only does the accurate determination of range affect his combat marksmanship proficiency, but is also necessary to report information accurately and to adjust artillery and mortar fire effectively.

b. Range Estimating Methods.--There are a number of methods for estimating range: measuring distances on maps, pacing the distance between two points, using a range card, using an optical range finder, and observing the impact of a round fired at the point in question. However, the combat rifleman does not usually have a map, and he rarely has access to an optical range finder. Pacing the distance

between two points is one method he can use, provided the enemy is not in the vicinity. Firing a round to determine the range is not desirable, since it may reveal his position to the enemy. Therefore, the rifleman's training must include methods which require no equipment and which can be accomplished without exposing himself or revealing his position. Three methods of estimating range which meet these requirements are the 100-meter unit of measure method, the appearance-of-objects method, and the range card method.

(1) 100-Meter Unit of Measure Method

(a) Techniques.--To use this method, the Marine must be able to visualize a distance of 100 meters on the ground. For ranges up to 500 meters, he determines the number of 100-meter increments between the two points he wishes to measure. (See fig. 6-2.) Beyond 500 meters, the Marine must select a point halfway to the target, determine the number of 100-meter increments to the halfway point, and then double it to find the range to the target. (See fig. 6-3.)

(b) Effect of Terrain.--During training exercises, the Marine must become familiar with the effect that sloping ground has on the appearance of a 100-meter increment. Ground which slopes upward gives the illusion of greater distance and observers have a tendency to overestimate a 100-meter increment. That is, they may select two points as being 100 meters apart when in fact they are less than 100 meters apart. Conversely, ground which slopes downward gives the illusion of shorter distance. In that case, the observer's tendency is to understimate; that is, to apply

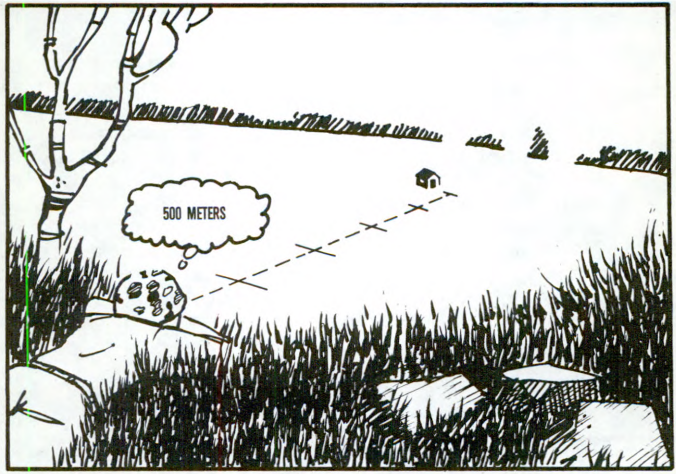


Figure 6-2.--Applying the 100-Meter Unit of Measure, Ranges up to 500 Meters.

a 100-meter unit of measure between two points which are actually 140 or 150 meters apart.

(c) Attaining Proficiency.--Proficiency in the 100-meter unit of measure method requires constant practice. Throughout training in the techniques of this method, comparisons should be continually made between the range estimated by the Marine and the actual range as determined by pacing or other more accurate means of measurement. The best training technique is to require the Marine to pace the range after he has visually determined it. In this way, he discovers the actual range for

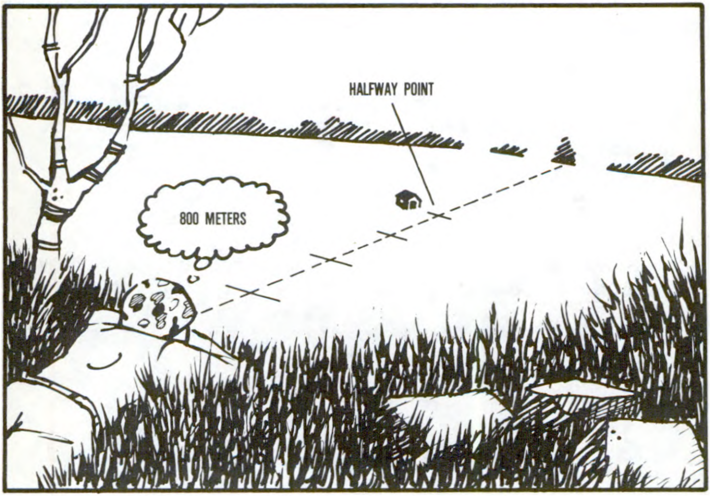


Figure 6-3.--Applying the 100-Meter Unit of Measure, Ranges Greater Than 500 Meters.

himself, which makes a much greater impression than if he is simply told the correct range.

(d) Limitations.--The greatest limitation of the 100-meter unit of measure is that its accuracy is directly related to how much of the terrain is visible to the observer. This is particularly true at the greater ranges. If a target appears at a range of 500 meters or more and the observer can only see a portion of the ground between himself and the target, it becomes very difficult to use the 100-meter unit of measure method of range determination with any degree of accuracy.

(2) Appearance-of-Objects Methods

(a) Techniques.--The appearance-of-objects method is a means of determining range by the size and other characteristic details of the object in question. The techniques used in this method of determining distances are commonly used by most people in their everyday living. For example, a motorist attempting to pass another car must estimate the distance of oncoming vehicles based on his knowledge of how vehicles appear at various distances. Of course, in this example, the motorist is not interested in precise distances, but only that he has sufficient road space to safely pass the car in front of him. Suppose, however, the motorist knew that at a distance of 1 kilometer an oncoming vehicle appeared to be 2.54 centimeters (1 inch) wide and 5.08 centimeters (2 inches) high, with about 1.27 centimeters (half an inch) between the headlights. Then, anytime he saw other oncoming vehicles which fit these dimensions, he would know they were about 1 kilometer away. This same technique can be used by riflemen to determine ranges on the battlefield. If he knows the characteristic size and detail of personnel and equipment at known ranges, then he can compare these characteristics to similar objects at unknown ranges. When the characteristics match, so then does the range.

(b) Attaining Proficiency.--To use the appearance-of-objects method with any degree of accuracy, the Marine must be thoroughly familiar with the characteristic details of objects as they appear at various ranges. For example, the Marine should study the appearance of a man when he is standing at a range of 100 meters. He fixes the man's appearance firmly in his mind, carefully noting details

of size and the characteristics of uniform and equipment. Next, he studies the same man in a kneeling position and then in a prone position. By comparing the appearance of these positions at known ranges from 100 to 500 meters, the Marine can establish a series of mental images which will help him determine the range on unfamiliar terrain. Training should also be conducted in the appearance of other familiar objects such as weapons or vehicles.

(c) Limitations.--Because the successful use of this method depends upon the visibility, anything which limits the visibility, such as weather, smoke, or darkness, will also limit the effectiveness of this method. (See fig. 6-4.)

(3) Combination of Methods.--Under proper conditions, either the 100-meter unit of measure or the appearance-of-objects method is an effective way of determining range; however, proper conditions do not always exist on the battlefield. Consequently, the Marine will be required to use a combination of methods. The terrain might limit using the 100-meter unit of measure method and the visibility could limit using the appearance-of-objects method. For example, an observer may not be able to see all of the terrain out to the target; however, he may see enough to get a general idea of the distance, say, within 100 meters. A slight haze may obscure many of the target details; however, the observer should still be able to judge its size. Thus, by carefully considering the approximate ranges as determined by both methods, an experienced observer should arrive at a figure close to the true range.

(4) Range Card Method.--A range card is a rough sketch made of an observer's area of

FACTORS TO BE CONSIDERED IN DETERMINING RANGE BY EYE	OBJECTS APPEAR NEARER THAN THEY REALLY ARE (RANGE UNDERESTIMATED)	OBJECTS APPEAR MORE THAN THEY REALLY ARE (RANGE OVERESTIMATED)
THE TARGET--ITS CLEARNESS OF OUTLINE AND DETAILS.	WHEN MOST OF THE TARGET IS VISIBLE AND OFFERS A CLEAR OUTLINE.	WHEN ONLY A SMALL PART OF THE TARGET MAY BE SEEN OR IS SMALL IN RELATION TO ITS SURROUNDINGS.
NATURE OF THE TERRAIN OR POSITION OF THE OBSERVER.	WHEN LOOKING ACROSS A DEPRESSION, MOST OF WHICH IS HIDDEN FROM VIEW. WHEN LOOKING DOWNWARD FROM HIGH GROUND. WHEN LOOKING DOWN A STRAIGHT, OPEN ROAD OR ALONG A RAILROAD TRACK.	WHEN LOOKING ACROSS A DEPRESSION, ALL OF WHICH IS VISIBLE. WHEN LOOKING FROM LOW GROUND TOWARD HIGH GROUND. WHEN FIELD OF VISION IS NARROWLY CONFINED AS IN TWISTED STREETS, DRAWS, OR FOREST TRAILS.
LIGHT AND ATMOSPHERE.	WHEN LOOKING OVER UNIFORM SURFACES LIKE WATER, SNOW, DESERT, OR GRAIN FIELDS. IN BRIGHT LIGHT OR WHEN THE SUN IS SHINING FROM BEHIND THE OBSERVER. WHEN THE TARGET IS IN SHARP CONTRAST WITH THE BACKGROUND OR IS SILHOUETTED BY REASON OF SIZE, SHAPE, OR COLOR. WHEN SEEN IN THE CLEAR ATMOSPHERE OF HIGH ALTITUDES.	IN POOR LIGHT SUCH AS DAWN AND DUSK, IN RAIN, SNOW, OR FOG, OR WHEN THE TARGET BLENDS INTO THE BACKGROUND OR TERRAIN.

Figure 6-4.--Factors Affecting the Appearance of Objects.

responsibility. (See fig. 6-5.) It shows the range and direction from the observer's position to easily recognizable objects, terrain features, avenues of approach, and possible enemy positions. If practicable, the observer should pace the distance between his position and reference points in order to minimize range errors. By referring to the range card, the observer can

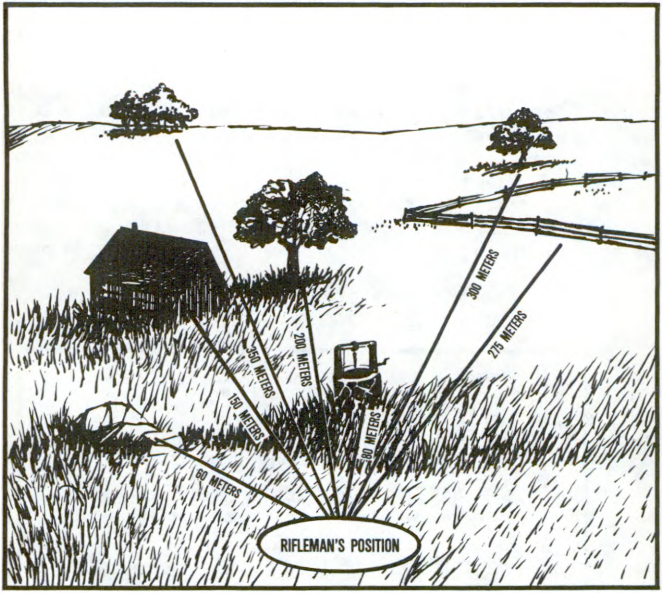


Figure 6-5.--Range Card.

quickly estimate the range to a target appearing in the vicinity of a reference point.

6204. APPLICATION OF BATTLESIGHTS

a. General.--Battlesights is the predetermined sight setting in elevation and windage

that will result in an intersection of the trajectory of the bullet and the line of sight at a range of 274 meters (300 yards). Because the trajectory is relatively flat for the first 300 meters of range, the battlesight setting on the rifle will enable the shooter to engage all combat-size targets by aiming directly at them at ranges from 0 to 300 meters without changing the sight setting. Consequently, he must learn to manipulate the rear sight when firing at targets at ranges greater than 300 meters. If the rear sight is properly calibrated as outlined in chapter 3, this is a simple task and allows the rifleman to engage all targets by aiming at the center of mass.

b. Principle of Using Battlesights.--With a zero of 274 meters (300 yards), the bullet will impact the target at the exact point of aim and will also cross the line of sight at a point approximately 34.08 meters forward of the muzzle on its way up to the peak of the trajectory. (See fig. 6-6.) This means that if a target were engaged at 34.08 meters with a 274-meter zero on the rifle, the bullet would hit the target at the point of aim. At all other ranges between 0 and 300 meters, pinpoint accuracy is not possible because the point of impact and point of aim will not be the same due to the trajectory of the bullet. However, the deviation caused by the bullet trajectory on a combat-sized target is considered negligible at all ranges up to 300 meters. The mission of the rifleman on the battlefield is to eliminate the combat capability of the enemy as quickly as possible. A rifle bullet hitting almost any area on the enemy's body, even the

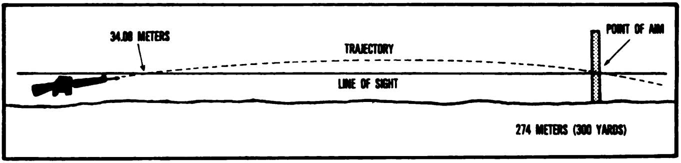


Figure 6-6.--Trajectory Crossing the Line of Sight.

arms or legs, will usually accomplish the mission. A bullet aimed at an enemy's chest that hits him in the region of the belt buckle eliminates him from the battle just as effectively as if it had hit the chest.

c. Rules for Applying Battlesights.--Since it is often difficult to obtain pinpoint accuracy on the battlefield, a system based on the application of battlesights has been devised to provide the required accuracy. This system permits the rifleman to aim directly at the point a hit is desired without making complicated, time-consuming adjustments to the rear sight of the rifle. General rules for applying battlesights are as follows:

(1) When Used.--Battlesights should be applied to all rifles within a combat zone when contact with the enemy is possible.

(2) Up to 300 Meters.--All targets at a range up to 300 meters will be engaged with the battlesight zero on the rifle.

(3) Over 300 Meters.--Targets at a range in excess of 300 meters will not be engaged until the long range aperture is raised. When targets are engaged at a greater range than

300 meters with the "L," long range, aperture raised, aim in on the target slightly high. Example: aiming at the neck or head area will ensure a hit in that area or slightly lower, depending on the exact range. The need for elevating the rear sight aperture at ranges greater than 300 meters can be demonstrated with tracer ammunition. This should be demonstrated by firing at a long-range target since this will give the most pronounced arc to the trajectory.

(4) Crosswind.--When firing with a crosswind, the rifleman compensates by applying the principles of marksmanship with respect to the effects of wind learned on the known-distance range.

6205. ENGAGING TARGETS (LEADS)

Unless a rifleman has specific orders to the contrary, targets are engaged as soon as they are detected. The rifleman is confronted with either stationary or moving targets in the case of enemy personnel. A stationary target is engaged by applying battlesights as prescribed in the previous paragraph.

a. Stationary Targets.--In combat, targets will very seldom be of the large, clearly outlined type found on the rifle range. Generally, they will be partially or wholly concealed, such as an enemy peering around a bush. His head will offer a very small target, but by firing into the part of the bush that his body is behind, the rifleman will have a large target and thus a better chance of obtaining a hit. The same holds true with an enemy firing from a window. Most buildings are not constructed

of heavy enough material to stop a rifle bullet, so if the visible target is small and difficult to hit, the rifleman must not hesitate to shoot at the portion of the wall the enemy is behind. (See fig. 4-3.)

b. Moving Targets.--Although there are less detection problems involved in locating moving targets than in stationary targets, the movement itself complicates the selection of an accurate aiming point. Unless the enemy is completely unaware of the rifleman's presence, he will normally move by rushes from one covered or concealed position to another. While making the rush, the enemy soldier presents a rapidly moving target. However, for a brief moment as he begins and ends the rush, the movement is usually slow. The reason for this is that a few steps are needed both to gather momentum to begin the rush and slow down to avoid overrunning the new position. It is at either of these two moments that a moving target is most vulnerable to aimed rifle fire. A target moving directly toward or away from the rifleman can be engaged in the same manner as a stationary target. However, to hit a target moving laterally across his front, the rifleman must aim far enough in advance of the target so the bullet will meet the target.

c. Leads.--The distances in advance of targets at various ranges that are required to hit them are known as leads. The lead required is determined by two factors: the range to the target, and the speed at which the target is moving.

(1) Normal Walk.--To hit a man moving laterally at a normal walk across his front at a range of 200 meters (219 yards) or less, the rifleman should aim at the forward edge of the body. (See fig. 6-7.) For ranges between 200 meters (219 yards) and 400 meters (437 yards), the rifleman should select an aiming point approximately one body width in front of the target. At ranges greater than 400 meters, the leads should increase to three body widths.

(2) Running.--IF THE TARGET IS RUNNING, THE LEADS FOR WALKING TARGETS ARE DOUBLED. (See fig. 6-8.) That is, at ranges of less than 200 meters, the rifleman aims approximately one body width in front of the target; between 200 meters (219 yards) and 400 meters (437 yards), approximately two body widths; and at ranges greater than 400 meters (437 yards), approximately five to six lengths depending on how much greater than 400 meters (437 yards)

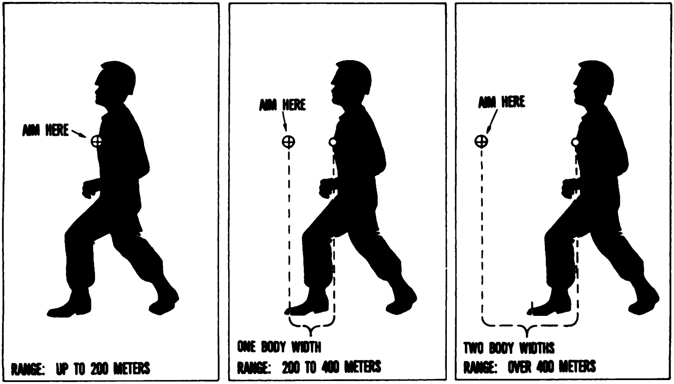


Figure 6-7.--Leads for Walking Target.

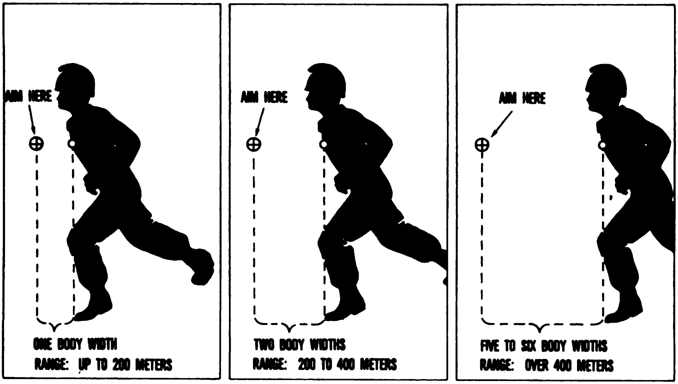


Figure 6-8.--Leads for Running Target.

the target is located. For running targets moving either away from or toward the rifleman at an oblique angle, the same rule for leads at laterally moving targets will apply. Although leads vary according to the speed and range of the target, the rules stated previously should be accepted as general rules in the application of basic marksmanship principles in the field.

6206. FIELD FIRING POSITIONS

During training in fundamentals, positions are taught as a step-by-step process. That is, the Marine is guided through a series of precise movements until he is in the correct position. The purpose of this is to ensure that he correctly applies all of the factors that assist him in holding the rifle steady.

The Marine will gradually become accustomed to the feel of the positions through practice, and eventually, he will know instinctively whether his position is correct. This is particularly important in combat since the Marine must be able to assume positions rapidly. There are any number of intermediate positions a combat rifleman might use before assuming his final firing position. Consequently, he must know instinctively whether his position is correct rather than follow a set sequence of movements to ensure its correctness.

a. Fundamentals Applicable to All Field Firing Positions.--As learned in previous instruction, on the battlefield, a rifleman must assume the steadiest position which can provide observation of the target area and some cover and/or concealment. Considering the many variables of terrain, vegetation, and tactical situations, there are innumerable positions that might be used. However, in most instances, field firing positions will be variations of those learned during preparatory marksmanship training and known-distance range firing. To assume any field firing positions, the rifleman should:

(1) Use any available support.

(2) Use the hasty sling when time permits.

(3) Avoid touching any part of the support with the rifle. This reduces control of the rifle and will significantly change the impact of the projectile.

(4) Adjust the position to fit the available support.

Figure 6-9.--Foxhole Position.

b. Common Field Firing Positions.--Some of the field firing positions the Marine is likely to use in combat are as follows:

(1) Foxhole.--(See fig. 6-9.) The foxhole position is used whenever such prepared positions are available. The Marine enters the foxhole; adds or removes dirt, sandbags, or other supports to best fit his height; and then assumes a comfortable firing position. He assumes this firing position by placing his right foot to the rear as a brace and then leaning forward until his chest is against the forward wall of the foxhole. He extends his left

arm and elbow over the forward side of the foxhole, thus supporting the left forearm with the parapet or sandbags. The Marine places the rifle butt into the pocket formed in his right shoulder and grasps the small of the stock with his right hand. He places the right elbow on solid support using the parapet of the foxhole or sandbags placed beside the foxhole. Finally, he obtains a spot weld and relaxes.

(2) Rubble Pile.--The rifleman must present the lowest possible silhouette behind the rubble, but at the same time use the rubble to achieve maximum support. (See fig. 6-10.)

(3) Kneeling Supported.--The Marine assumes the kneeling position as discussed in chapter 4. He then shifts his weight forward until his left shoulder, left arm, and left leg come in contact with the support. The rifle must not touch or rest on the support since the friction of the rifle against the support would slow recovery between shots and limit the rifleman's ability to rapidly shift his point of aim. (See fig. 6-11.)

(4) Log.--Marines who are right-handed should fire from the right end of the log and those who are left-handed from the left end of the log. This ensures a comfortable position by the log. (See fig. 6-12.)

(5) Prone Supported.--The Marine assumes the prone position as discussed in chapter 3. He then adjusts the position to fit the available support, placing his left forearm against the support. It is unimportant to position the left elbow directly under the rifle in this position because now the support sustains the weight of the rifle rather than the arm. (See fig. 6-13.)

Figure 6-10.--Rubble Pile Position.

(6) Barricade.--The rifleman assumes a position which permits him to fire over the barricade or wall while presenting a low silhouette. The height of his position will depend on his own height in relation to the height of the wall. (See fig. 6-14.)

(7) Forward Slope.--The rifleman adapts the standard sitting position, as discussed in chapter 3, to the slope of the mound. (See fig. 6-15.)

Figure 6-11.--Kneeling Supported Position.

(8) Rooftop.--The rifleman places his left arm over the apex of the roof in such a manner that he can hold the weight of his body but not expose too much of his head and shoulders. (See fig. 6-16.)

(9) Bunker.--When firing from a bunker, the same technique is used as in the foxhole position.

(10) Window Position.--When firing from a window, where possible, the rifleman should remain well back from the opening of the

Figure 6-12.--Log Position.

window so his rifle will not protrude through it. He should position himself to the right or

Figure 6-13.--Prone Supported Position.

left of the window (depending whether he is shooting right or left-handed), concealing the major portion of his body from the enemy's view, while retaining good observation of the target area. (See fig. 6-17.)

6207. TIME ELEMENT IN ENGAGING A COMBAT TARGET

a. Single Targets.--There is a definite correlation between the range to a target and the time required to hit it. A slight error in

Figure 6-14.--Barricade Position.

sight alignment will still produce a hit at a range of 75 meters, but the same error will cause a miss at a range of 300 meters. Therefore, it generally requires more time to fire an effective round at longer ranges since extra care must be taken in the application of fundamentals. From the combat rifleman's viewpoint, this relationship between range and time must also take into consideration the degree of personal danger posed by enemy targets. The closest enemy targets are normally the most

Figure 6-15.--Forward Slope Position.

dangerous, and the speed with which they are engaged becomes increasingly important as the range decreases. Considering all of these factors then, the combat rifleman must possess both speed and accuracy in firing on enemy targets. At shorter ranges, speed must be emphasized, and at longer ranges, accuracy must be emphasized. When moving in the open, these factors have an added application in determining the best firing position from which to engage and surprise enemy targets. Through

Figure 6-16.--Rooftop Position.

practice, it can be determined which of the positions provide the best combination of speed, accuracy, and observation for various target situations and the rifleman's own capabilities.

b. Multiple Targets.--If a combat rifleman hits one of three enemy targets, he can expect the other two to quickly seek cover. Consequently, he must be able to rapidly shift his point of aim and fire at a second, and even a third, enemy target before they have an

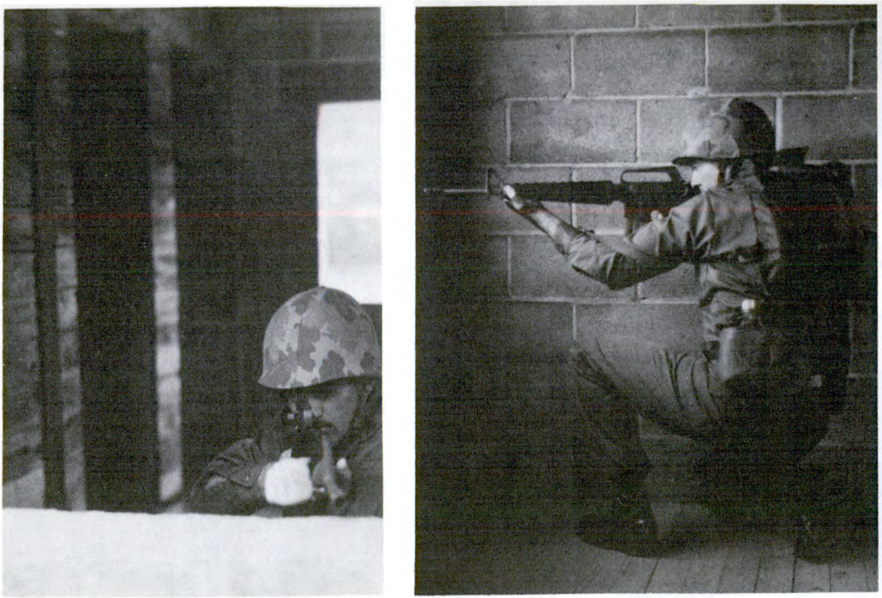


Figure 6-17.--Window Position.

opportunity to reach a protected position. Firing first at the enemy closest to the nearest cover may give the rifleman additional time to effectively engage the other targets.

c. Immediate Action on Stoppages.--During field range firing, one dummy round should be placed among the live rounds in the shooter's magazine or clip. When this round fails to fire, he must rapidly pull the charging handle to the rear, eject the dummy round, release the charging handle so a new round is loaded, resume his position, and fire at the target. This procedure is known as "immediate action." The shooter must learn to perform this action rapidly and instinctively in combat or his target will be gone before he can fire. A slight hesitation in performing "immediate action" might well give an enemy rifleman just time enough to fire a killing round. Since speed is so important, the shooter should not be given additional time during the exercise to perform the "immediate action" required.

6208. ASSAULT FIRE

a. General.--Successful advance by fire and maneuver leads naturally to an assault of the target area or objective. Assault fire is that fire delivered by a unit during its assault on a hostile position.

b. Technique.--The rifleman fires well-directed shots from either the offhand or "pointing" position. (See fig. 6-18.) The pointing position is similar in all respects to pointing a shotgun. It is assumed from a standing or crouch position by rapidly placing the rifle

Figure 6-18.--Assault Position Utilizing Pointing Technique.

in the vicinity of the shoulder. With both eyes open and focused upon the target, the rifleman "points" the rifle at the target. This method provides a natural line of sight

long the axis of the bore and enables the
rifleman to deliver a high rate of accurate
fire. Firing from the hip is ineffective and
should not be used. The rifleman fires as
rapidly as possible at known or suspected enemy
locations on the portion of the objective which
corresponds with their position in the assault
formation.

209. NIGHT FIRING

a. General.--Individual night-firing
training teaches the Marine to detect and hit
targets at night or during other periods when
conditions of limited visibility (e.g., smoke
or fog) prevent the conventional use of sights.

b. Training Conditions.--Individual
night firing training should be conducted fol-
lowing daytime marksmanship training, since
many of the procedures used at night are the
same or very similar to those used during the
day. Night fire courses should be scheduled
only under light conditions of a half moon or
less. If there is greater light intensity, an
individual could use his sights in the same
manner as in daytime firing. If he does, he
will fail to learn the proper night-firing tech-
niques and thus be ineffective during periods
of limited visibility.

c. Fundamentals.--Firing a rifle at night
is similar in many respects to firing during the
daytime. With the single exception of stock
weld, the principles of marksmanship discussed
in chapter 4 apply equally as well at night as
during the day, so it follows that the absence
of light makes these two techniques even more

difficult at night. Consequently, night-firing training should be focused on teaching Marines the night application of target detection and weapon alignment.

d. Target Detection.--Training in the night application of target detection consists of exercises stressing the principles of night vision and applying night vision to night firing.

(1) Principles of Night Vision.--The principles of night vision are dark adaptation, off-center vision, and scanning. These principles are discussed in FMFM 1-3A, Field Firing Techniques, which outlines facilities and exercises required to conduct night-vision training. This training is a necessary prerequisite to night-firing exercises.

(2) Application of Night Vision to Night Firing.--Once the shooter understands the principles of night vision, he must learn to apply them in firing his weapon. He must hold his head high so the eyes are well above the weapon, increasing the field of vision and improving the sharpness of detail. He must keep both eyes open, thus getting maximum visual coverage of the target area. With both eyes open, the shooter also has better depth perception.

e. Weapon Alignment.--A natural pointing technique is used to align the rifle on the target. (See fig. 6-19.) The sights cannot normally be seen at night, and any attempt to use them in the conventional manner will usually cause the shooter to lose the target. The pointing technique can be applied to any position; however, either the foxhole or prone

Figure 6-19.--Night Prone Position.

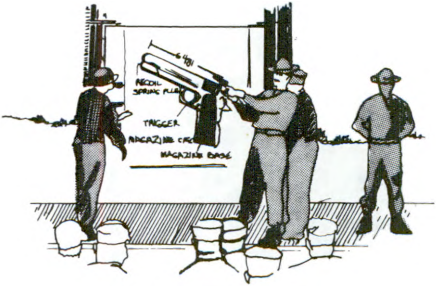
supported position should be used in training. These positions are the most difficult from which to detect targets at night, this offers the greatest challenge to the individual's night firing ability. To assume a correct firing position at night, the same initial position is assumed as in the daytime; however, once in position, the following changes must be made:

(1) Position of the Head.--The head is above the rifle. A good technique is to rest the chin on the comb of the stock. This ensures that the eyes are well above the rifle

and assists in obtaining the correct horizontal alignment on the target. If the chin is placed on either side of the stock, there will be a tendency to pull the muzzle of the rifle to the right or left to intersect the line of sight to the target. This will cause the bullet to go right or left of the target.

(2) Eyes Open.--Both eyes must be kept open at all times for better vision and depth perception.

(3) Depressed Muzzle.--A bold depression of the muzzle of the rifle is made with the eyes above the rifle. The natural tendency is to raise the muzzle until it intersects the line of sight to the target. This will cause the bullet to pass over the target. To avoid this error, the left hand is moved slightly forward just prior to aligning the rifle on the target. This action forces the muzzle to drop.



CHAPTER 7

BASIC PISTOL AND REVOLVER TRAINING

Section I. INFORMATION

7101. GENERAL

The Marine Corps requires certain Marines to be armed with either the .45-caliber pistol or .38-caliber revolver in the performance of their assigned duties. The purpose of this chapter is to provide a general understanding of the basic principles of marksmanship.

7102. SCOPE

In order to condense the input into this chapter, where training in the pistol and revolver is similar, reference will be made to the paragraph pertaining to the pistol that may be used for training with the revolver. Additional information as to mechanical and detailed instruction is found in FM 23-35, <u>Pistols</u>

and Revolvers.

7103. GENERAL DESCRIPTION AND DATA

a. Description.--The .45-caliber automatic pistol, M1911A1 (see fig. 7-1), is a semiautomatic, recoil-operated, magazine-fed, hand weapon. The pistol fires one round each time the trigger is pulled. The energy needed to operate the pistol comes from the recoil created by the rearward force of expanding powder gases of a fired round. The magazine holds seven cartridges. When the last cartridge from the magazine is fired, the slide remains to the rear.

b. Data

(1) Diameter of bore: 0.45 inches.

Figure 7-1.--.45-Caliber Pistol.

(2) Number of lands and grooves: Six.
(3) Length of barrel: 5.03 inches.
(4) Rifling, left hand, one turn in: 16 inches.
(5) Length overall: 8 5/8 inches.
(6) Weight: With empty magazine - 2.4 pounds; and with loaded magazine (7 rounds) - 3 pounds approximately.
(7) Height of front sight above axis of bore: 0.5597 inches.
(8) Sight radius: 6.481 inches.
(9) Chamber pressure (maximum): 17,000 psi.
(10) Muzzle velocity (maximum): 830 fps.
(11) Maximum range: 1,500 meters.
(12) Maximum effective range: 50 meters.
(13) Trigger pull: 5 to 6½ pounds.
(14) Rate of fire: Limited only to the individual's ability to change magazine rapidly, aim, and fire.

7104. LOADING AND UNLOADING TECHNIQUES

a. Loading.--The safest way to load the .45-caliber automatic pistol is to firmly grip the pistol in the shooting hand with the slide locked to the rear. When the command "load" is given, maintaining the position of raised pistol, insert the magazine into the magazine well until it locks in place. Place the thumb of the shooting left hand on the hammer, depress the hammer until it stops. Using the index finger of the shooting hand, depress the slide stop; the slide will go forward. Place thumb safety on safe. Using the nonshooting hand, grasp pistol by

the slide forward of the trigger guard and obtain proper grip.

b. Unloading.--If the pistol is empty and the slide is locked to the rear, depress the magazine catch and remove the magazine from the pistol. To unload with a round in the chamber, place the thumb safety on safe. Depress the magazine catch and remove the magazine. Depress the thumb safety. Using the thumb of the right hand, push up on the slide stop. Using the left hand, pull the slide sharply to the rear. Check the chamber.

7105. TRAINING

The primary use of the pistol or revolver is to engage an enemy at close range with quick, accurate fire. Accurate shooting results from knowing and correctly applying the basic principles of marksmanship. Since all marksmanship training is progressive, it is important that each individual become familiar with the fundamentals required to achieve an accurate shot.

a. Phases of Training

(1) There are three phases of marksmanship training:

(a) Preliminary marksmanship training.

(b) Known-distance range firing.

(c) Field range firing.

(2) The phases of marksmanship are progressive in nature and compliment one another. It is unlikely that a phase can be eliminated without detracting from the objectives discussed in paragraph 1202.

b. Preliminary Marksmanship Training.--The purpose and requirements of this phase of training is outlined in subparagraph 1203b(1). Each individual must learn the fundamentals of pistol marksmanship and their application. There are basically eight fundamentals that are interrelated and must be properly applied each time a shot is fired if accurate results are to be expected:

(1) Stance.
(2) Position.
(3) Grip.
(4) Breath control.
(5) Sight alignment.
(6) Sight picture.
(7) Trigger control.
(8) Effects of weather.

c. Known-Distance Range Firing.--The purpose of this phase is the same as discussed in subparagraph 1203b(2). The importance of this phase cannot be overemphasized. The development of the individual's mastery of the fundamentals, refining his techniques of fire, and instilling confidence is paramount during this phase.

d. Field Range Firing.--After the shooter has had the opportunity to develop his shooting ability, it is then necessary that he gain experience under field conditions. The purposes and objectives of this phase are as stated in subparagraph 1203b(3).

7106. SAFETY AND CARE OF THE PISTOL AND REVOLVER

In addition to the preceding subjects,

safety precautions (see section II, app. A) and care and cleaning of the .45-caliber, M1911A1 pistol and .38-caliber revolver (see section II, app. C), are subjects of special importance and should be taught and emphasized throughout the training cycle.

7201. GENERAL

The fundamentals of pistol marksmanship embrace all of those physical factors essential to the firing of an accurate shot. Essentially, accurate shooting with a pistol requires no elements other than those described in paragraph 7105b.

7202. STANCE

The excellence of the stance is a major factor in creating conditions for maximum control. Every individual possesses a combination of individual characteristics that are peculiar to him alone. Among these are height, weight, and proportion of body development to muscle systems. It follows that there cannot be any definite, all-purpose stance which applies equally to all shooters. The shooter, on the basis of his own particular configuration, must find a stance which provides the greatest degree of stability for his body.

a. <u>Main Requirements of a Stance</u>

(1) Equilibrium and stability - The greatest possible degree of equilibrium and stability in the body-weapon system with the least possible strain on the shooter's muscles. If an individual is tense, it is a sign of strain, thus causing rapid muscle fatigue.

(2) Head position - A head position which will allow for the most efficient use of the shooter's eyes throughout the sighting and

aiming process. The head should not have an unnatural tilt to it.

b. Proper Stance.--The shooter should become familiar with assuming the proper stance and practice getting the same stance each time. (See figs. 7-2, 7-3, and 7-4.)

(1) Position of the feet - about the width of the shoulders with toes pointed out slightly.

(2) Legs - straight but not tense. Allow the knee joints to fall into a semilocked position, but relaxed.

(3) Hips - should be level and in a natural position.

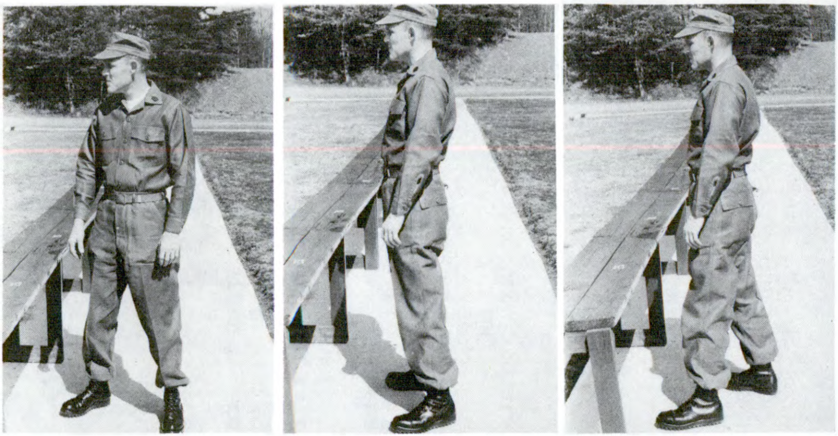
(4) Nonshooting arm - (one-hand shooting only) relaxed and in side pocket.

(5) Head and shoulders - level; no hunching over or slouching with an unnatural tilt to the head.

(6) Shooting arm - should be extended with the wrist stiff and the elbow locked without strain. Do not flex the bicep of the shooting arm. By making the wrist stiff, locking the elbow to ensure the arm is straight, and raising the arm so it is horizontal with the ground, the shooter has flexed the necessary muscles in his shooting arm for maximum control.

7203. POSITION

When the shooter has attained a comfortable and stable stance, it is necessary to align himself with his target in order to aim and hold the target in a natural and consistent manner. The shooter must position himself so as to



A B C

Figure 7-2.--Alternate Shooting Stances.

naturally point himself and his weapon, maintaining a hold which will remain in the desired area without a tendency of the shooting arm to drift away from the aiming area.

a. Proper Position.--To obtain a proper position, use the following methods:

(1) Face the target a a 45-degree angle, assuming the proper stance (one-hand shooting). (See fig. 7-3A.) The shooter can vary his angle to the target up to 90 degrees if this allows for better control.

(2) Face the target squarely (two-hand shooting position). (See fig. 7-3B.)

(3) Face the target squarely (combat-type position), step off with the left foot (right-hand shooter), placing the feet apart about the width of the individual's shoulders (the opposite for left-handed shooters). (See fig. 7-3C.) This is a variation of subparagraph (2) above.

(4) Position the head so that the shooter is looking at the target with eyes straight ahead.

(5) Raise the shooting arm and align it with the target.

(6) Close the eyes, lower and raise the arm, and relax.

(7) Open the eyes and check position. If the sights are aligned with the target, position is good.

(8) If the arm settles to one side of the target, compensate by moving the feet right or left as necessary. If the arm settles high or low, compensate by closing or opening the distance between the feet. Never correct by moving the arm. This type of correction is

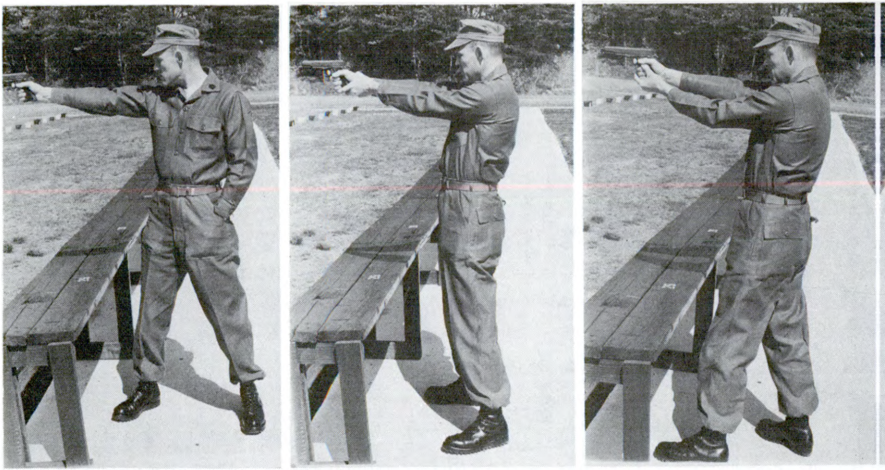


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Figure 7-3.--Proper Shooting Positions.

purely artificial and the arm will have a tendency to return to its natural position after recoil of a shot.

7204. GRIP

The proper grip is one which provides the shooter with the maximum control of the weapon. The most important feature of grip is uniformity. To maintain a natural sight alignment, a shooter must hold the weapon firmly and be able to apply positive, straight to the rear pressure on the trigger that will not disturb sight alignment when the hammer falls.

a. Methods of Proper Grip

(1) With the nonshooting hand, pick up the pistol by the barrel end of the slide, being careful not to smudge the blackened sight. Keep the muzzle pointed down range.

(2) Spread the index finger and thumb of the shooting hand apart to form a "V" with the thumb held slightly lower than the index finger. Pushing down on the pistol with the nonshooting hand, push the web or "V" of the shooting hand directly under the tang of the grip safety. Do not roll the web of the shooting hand under the grip safety. (See fig. 7-4.)

(3) Wrap the three lower fingers around the pistol. Ensure that there is no space between the palm of the shooting hand and the pistol stock. The three lower fingers should exert equal pressure, straight to the bottom of the "V" created by the index finger and thumb. The heel of the shooting hand should be well up on the main spring housing. (See fig. 7-5.)

Figure 7-4.--Method of Proper Grip.

(4) The thumb should exert very little pressure as any tightening of the muscles controlling the thumb will cause some tightening of muscles controlling the trigger finger. The thumb should be parallel with the index finger

Figure 7-5.--Method of Proper Grip.

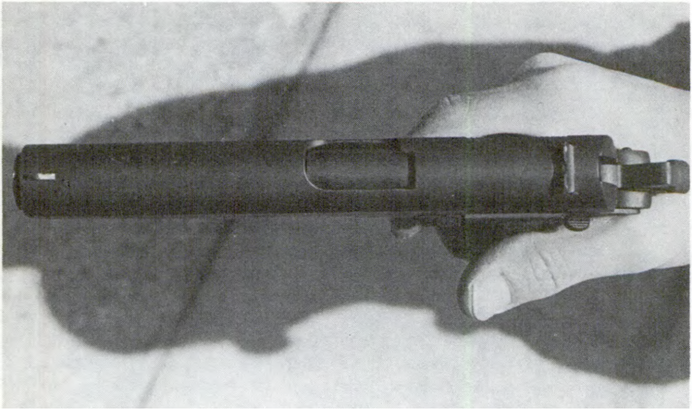


Figure 7-6.--Method of Proper Grip.

because it is then in its natural position. (See figs. 7-6 and 7-7.)

(5) Placement of the trigger (index finger should be where it falls naturally on the trigger. (See figs. 7-8 and 7-9.) Regardless of hand size and finger length, the shooter should always apply pressure straight to the rear with the first point of the finger. Never place the tip of the finger on the trigger. This will cause a strain in getting a shot off and will make the trigger weight much heavier than it actually is.

(6) Correct pressure on the grip is when the shooter can hold without a tremble or free action of the trigger. A good method for obtaining the correct pressure is to squeeze with the entire hand until pistol and hand

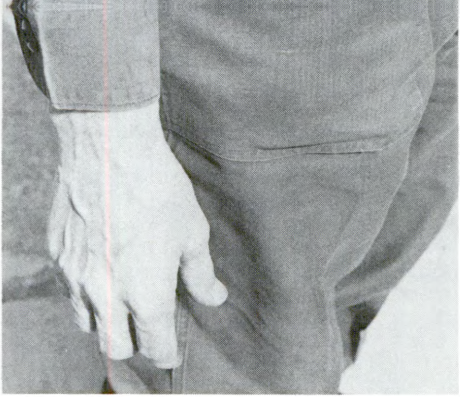


Figure 7-7.--Method of Proper Grip.

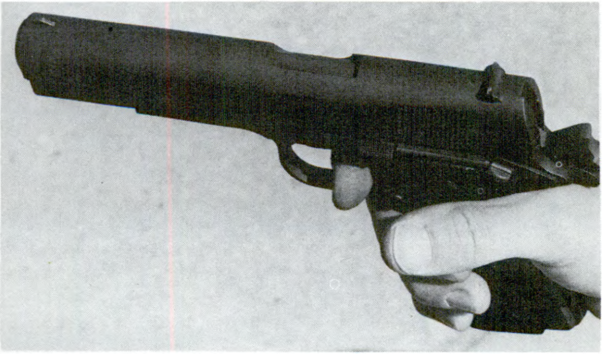


Figure 7-8.--Method of Proper Grip.

Figure 7-9.--Method of Proper Grip.

starts to tremble, then gradually relax the grip until trembling ceases. When this occurs, the proper amount of pressure is being applied.

(7) There are many variations that may be used for a two-handed grip. The two-handed grip is used to support the shooting hand of the shooter, thereby allowing more accuracy. To obtain a two-handed grip, grasp the weapon as previously described, then firmly close the fingers and thumb of the free hand over the firing hand in a manner that will provide maximum support without affecting the grip of the shooting hand. (See figs. 7-10 and 7-11.)

(8) Another variation of the two-handed grip is the combat-type. (See figs. 7-12 and 7-13.) Grip the pistol in the shooting hand as previously described. Spread the fingers of

Figure 7-10.--Method of Proper Grip.

the nonshooting hand, seat the heel of the shooting hand in the middle of the palm of the nonshooting hand. Place the thumb of the non-shooting hand between the end of the fingers and thumb of the shooting hand. (If you have

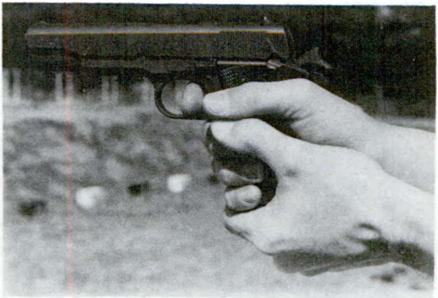


Figure 7-11.--Method of Proper Grip.

Figure 7-12.--Method of Proper Grip.

long fingers, never place the thumb of the support hand under the thumb of the shooting hand.)

Figure 7-13.--Method of Proper Grip.

Wrap the fingers of the supporting hand around the heel and wrist of the shooting hand. This two-handed grip works well with the shooter who has trouble keeping his wrist from coming unlocked during firing.

7205. BREATH CONTROL

The correct method of breathing is an essential part of the shooter's system of control. Most shooters know less about the proper breath control than any of the other fundamentals. The object of proper breath control is to enable a shooter to hold his breath with a comfortable feeling, long enough to fire one shot slow-fire, five shots in 15 seconds rapid-fire, or five shots in 20 seconds timed-fire without disturbing the hold or concentration on sight alignment.

a. Systematic Employment of Breath Control.--To be effective, breath control must be employed systematically and uniformly, which aids in the ability to concentrate and maintain the proper rhythm.

(1) It is generally known that one must breathe during aiming. Breathing is accompanied by the rhythmical movement of the chest, abdomen, and shoulders. This causes the pistol to move about excessively, making it almost impossible to produce an accurate shot. Therefore, one must not simultaneously breathe and try to fire a shot, but must endeavor to hold the breath for a short period of time.

(2) In order to ensure that during prolonged firing, the repeated process of holding the breath does not have an adverse effect on the shooter, the breath must not be held too

long when trying to fire a slow-fire shot. If the shooter cannot shoot a shot in 8 to 10 seconds, he must stop, bring the pistol down, put the thumb safety on, making sure the grip is still correct. Before holding the breath for the next shot, one or two deep breaths should be taken to ventilate the lungs. This practice will protect the body from excessive and premature fatigue.

(3) Experience has shown that a definite sequence should be established when holding the breath to minimize the strain on the body functions. This sequence is based on the firing line commands and can be paced by the individual shooter to meet his physical requirements. The following sequence is recommended:

(a) "Ready On the Right".--Take a deeper than normal breath and exhale.

(b) "Ready On the Left".--Take another deeper than normal breath, exhale, and extend the shooting arm.

(c) "Ready On the Firing Line".--Take a final breath and exhale to the point of comfort.

(l) As the shooter gains more experience in proper breath control, he will go through the sequence of holding without being conscious of the effort. As a result, a higher degree of concentration can be devoted to controlling sight alignment and trigger pressure.

7206. SIGHT ALIGNMENT AND SIGHT PICTURE

Sight alignment is the relationship between the front and rear sights with respect to the eye. The front sight is centered in the rear sight vertically and horizontally. Proper alignment of the front sight and rear sight is

the most important fundamental of pistol marksmanship. Sight picture is the holding of the correct sight alignment on the bullseye in the aiming area.

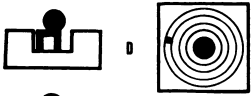
a. Relationship of Sights

(1) If the shooter does not observe correct aiming (maintaining the top surface of the centered front sight on a level with the top of the rear sight and equal space on each side of the front sight), there will be few accurate shots. More often than not, the front sight is located in a different position in the rear sight. This accounts for a greater dispersion of shots on the target, since the bullets will deviate in the direction in which the front sight is positioned in the notch. (See fig 7-14.)

(2) It is necessary to be aware of the relationship of the rear sight to the clearly defined front sight. Normal vision is such that the rear sight of the pistol will be as nearly in focus as the front sight. Some shooters may be able to see only the notch of the rear sight in sharp focus; the outer extremities may become slightly blurred.

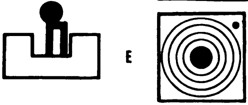
(3) The accuracy of a shot depends mainly upon the shooter's ability to consistently maintain correct sight alignment. The main effort should be toward keeping the sights aligned. Holding a pistol perfectly still is desirable, but it is not necessary in order to hit the center of the bullseye.

(4) It is imperative to maintain "front sight point of focus" throughout the sighting and aiming process. The shooter must



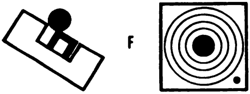
D

TOP OF FRONT SIGHT LEVEL WITH REAR, TOO MUCH LIGHT ON RIGHT SIDE OF FRONT SIGHT IN REAR SIGHT NOTCH. SHOT TO LEFT, 9 O'CLOCK.



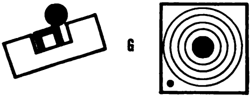
E

TOP OF FRONT SIGHT HIGHER THAN TOP OF REAR. TOO MUCH LIGHT ON LEFT SIDE OF FRONT SIGHT IN REAR SIGHT NOTCH. SHOT HIGH AND RIGHT.



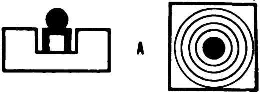
F

TOP OF FRONT SIGHT LEVEL WITH REAR, TOO MUCH LIGHT ON LEFT SIDE OF FRONT SIGHT IN REAR SIGHT NOTCH. PISTOL "CANTED," SHOT LOW AND RIGHT.



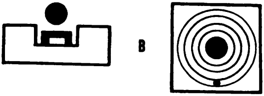
G

TOP OF FRONT SIGHT LEVEL WITH TOP OF REAR, TOO MUCH LIGHT ON RIGHT SIDE OF FRONT SIGHT IN REAR SIGHT NOTCH. PISTOL "CANTED," SHOT LOW AND LEFT.



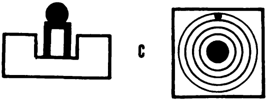
A

PERFECT ALIGNMENT. TOP OF FRONT SIGHT LEVEL WITH THE TOP OF REAR. EQUAL LINE OF LIGHT ON EITHER SIDE OF FRONT SIGHT IN REAR SIGHT NOTCH. PERFECT SHOT.



B

FRONT SIGHT LOWER THAN TOP OF REAR, EQUAL LINE OF LIGHT ON EITHER SIDE OF FRONT SIGHT IN REAR SIGHT NOTCH. SHOT TOO LOW.

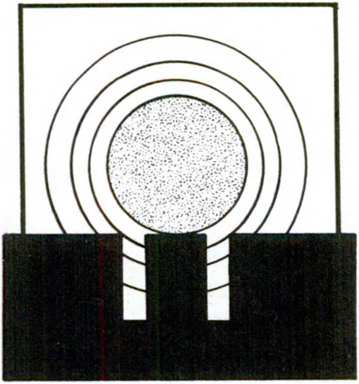


C

TOP OF FRONT SIGHT HIGHER THAN TOP OF REAR. EQUAL LINE OF LIGHT ON EITHER SIDE OF FRONT SIGHT IN REAR SIGHT NOTCH. SHOT TOO HIGH.

Figure 7-14.--Angular Error Effects.

concentrate on maintaining the correct relationship between front and rear sight, and the point of focus must be on the front sight during the shot period required to deliver the shot (see fig. 7-15.) If the focus is displaced forward, and the target is momentarily in clear focus (see fig. (7-16), the ability of the shooter to achieve correct sight alignment is jeopardized for that moment. Frequently, this is the moment that the pistol fires. A controlled,



PROPER. CONTROL ALIGNMENT IS PRECISE.

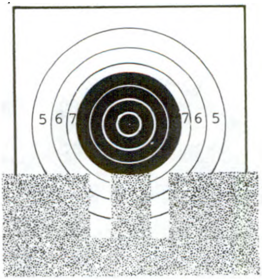
FOCUS LIMITED TO FRONT SIGHT ONLY,

RENDERS THE SIGHTS DISTINCT AND TARGET

INDISTINCT AND SIGHT RELATIONSHIPS CAN

BE CONTROLLED CONSTANTLY.

Figure 7-15.--Proper Sight.



IMPROPER. CONTROL OF SIGHT ALIGNMENT IS NOT PRECISE. DISTINCT FOCUS ON TARGET RENDERS SIGHT INDISTINCT.

Figure 7-16.--Improper Sight.

accurate shot is impossible under these conditions.

b. <u>Sight Picture</u>.--When sight alignment is understood, the shooter is then taught where to aim on the target. This differs from sight alignment only with respect to adding a bullseye or aiming point to the front sight blade.

(1) <u>Aiming Points</u>.--There are two aiming points: "6 o'clock hold" and "center hold." (See figs. 7-17 and 7-18.) Those who used the "6 o'clock hold" say it gives them a clear definition of the sights, since they have black sights positioned on a white target. It also provides a more definite aiming point. Those who use a "center hold" say that when they aim center, they have a convenient aiming area in the black. In addition, they feel that since

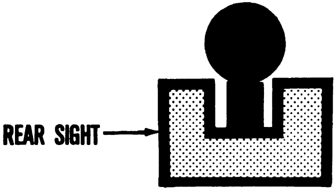


Figure 7-17.--
6 O'clock Hold.

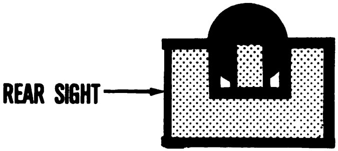


Figure 7-18.--
Center Hold.

they have black sights on a black target, they must focus on the sights to differentiate between the sights and the target. Some shooters use a combination of both aiming points. For slow-fire, a "6 o'clock hold" is used; during timed and rapid-fire, an individual may use the "center hold." Whatever aiming point or combination of aiming points that are utilized, it is important that the same technique is followed each time a shooter fires the course.

7207. TRIGGER CONTROL

Trigger control is the method used to apply pressure on the trigger so that the shot can be fired with the least amount of disturbance to sight alignment. There are many methods of applying trigger pressure that, if used correctly and uniformly, will give positive results. The term "trigger pressure" is more applicable to accurate shooting than the term "trigger squeeze." "Squeeze" is used incorrectly in connection with trigger control in that it implies the closing of all four fingers and thumb together at the

same time. This is not proper trigger control. The pressure on the trigger must come from the trigger finger only. The gripping fingers and thumb do not move.

a. Placement of Trigger Finger.--The position of the trigger finger on the trigger is not so important as long as pressure is able to be applied straight to the rear. Each shooter will have to find the spot on the trigger finger which suits him best; usually, either the first joint of the index finger (see fig. 7-19A) or first bone section of the index finger (see fig. 7-19B). This can vary with each individual. If the finger presses the trigger to the side, this can cause additional friction on certain parts of the trigger mechanism. Only a slight pressure to the side is required to bring about a significant error in sight alignment.

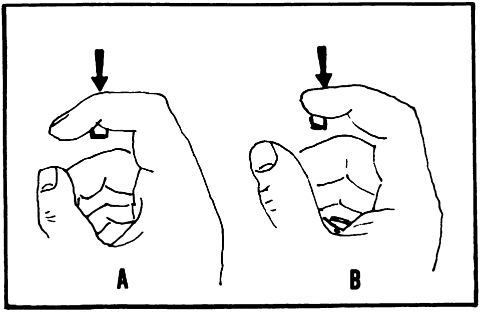


Figure 7-19.--Correct Placement of the Index Finger on the Trigger.

b. <u>Positive Uninterrupted Trigger Pressure</u>.--A positive uninterrupted trigger pressure or surprise shot method, is primarily the act of completing the firing of the shot once starting the application of trigger pressure. The shooter is committed to an unchanging rate of pressure, no speeding up, slowing down, or stopping. The trigger pressure is of an uninterrupted nature because it is not applied initially unless conditions are settled and near perfect. If the perfect conditions deteriorate, the shooter should not fire, but bench the weapon, relax, replan, and start again.

c. <u>Precision Interrupted Trigger Pressure</u>.--The interrupted application of the trigger pressure or the "point" shooting method, is a method of trigger control not recommended although used by some shooters. To use this method, the shooter aligns the sights and exerts initial pressure on the trigger. He then makes every effort to hold the pistol motionless. It is during these motionless moments, while the sights are perfectly aligned, that pressure is applied to the trigger. If the sights are perfectly aligned, as movement of the pistol increases, the pressure on the trigger is maintained but not increased. When sight alignment is again perfect and the movement diminishes, pressure on the trigger is continued until the shot breaks. When using the "precision method," the shooter must be well aware of his capabilities for holding. When the weapon fails to fire within the limited time and the shooter cannot hold with minimum movement, trigger pressure should be released and the pistol returned to the bench. When using either the "positive" or "precision" methods, it is important that the actual break

of the shot comes as a complete surprise. When a shooter achieves the surprise aspect of firing, he is well on his way to mastering trigger control.

7208. EFFECTS OF WEATHER

Some shooters consistantly shoot good scores regardless of the weather; while some only shoot good scores in good weather. To consistently fire high scores, each shooter should know how to combat wind and unusual conditions.

a. Wind Shooting

(1) Wind shooting is conducive to jerking the trigger. This is true because as the arc of movement increases, the shooter develops a tendency to relax his trigger pressure. He is waiting for a more stable sight picture. His concentration on sight alignment will diminish and he will make an effort to set the shot off on the move as the sights pass the vicinity of the target center. The obvious answer is to first wait for a lull in the wind; next, concentrate as one normally does on sight alignment; and as a minimum of movement for the existing conditions is sensed, start an ever increasing pressure on the trigger until the shot is fired. Do not continue to hold during extreme gusts. Always take advantage of a chance to rest. Each attempt to fire a shot should be made with a firm resolve to align the sights and apply positive increasing trigger pressure until the shot is fired.

(2) A shot group will be larger as a result of the increased movement, but the wild shots resulting from faulty sight alignment,

flinching, jerking, and over correction, will be minimized. During timed and rapid-fire, the shooter has to fire when the commands are given, wind or no wind. The means of overcoming this disturbing handicap are as in slow-fire, but with less positive results, generally because the shooter cannot wait for lulls in the wind. Concentration on sight alignment, regardless of movement caused by wind, will result in groups only slightly larger than those fired under ideal conditions.

(3) Slight changes in body stance may assist the shooter in compensating for wind. During slow-fire stages, a shooter may spread his feet a few inches more than normal, thus lowering the body balance. If there is a wind blowing during timed and rapid-fire, he can turn his feet inboard slightly, bend his knees, and lean into the pistol slightly more than normal. He can spread his legs a bit wider than normal and tighten up his body slightly. This will help him brace himself against the wind.

b. Unusual Conditions

(1) Adverse weather conditions such as cold, hot, or rainy weather, or dim light pose problems that can be solved in much the same manner as in wind shooting. Determine to adhere to the fundamentals and ignore as much as possible the distractions that have a demoralizing effect on each individual. Pocket warmers, raincoats, and sweatbands are a help, but the major portion of accomplishments on the firing range stems from a mental capacity to face up to the out of the ordinary and parlay these conditions into a successful score.

(2) Poor conditions must never become an excuse for less than a maximum effort. Good scores are produced by hard work, regardless of conditions.

7301. GENERAL

In order to successfully apply the fundamentals of pistol marksmanship, a shooter must establish a pattern or sequence when he moves to the firing line. To assist in the step-by-step process of setting up the ideal conditions in which to fire an accurate shot, the shooter should follow this sequence, starting from the preparation period to the actual firing of the shot. Once this sequence is established, each step will become a habit. The more steps the shooter can perform by habit, the more time he will have to devote toward intense concentration.

a. Slow-Fire

(1) During the slow-fire stage, patience can be considered a key element. It is true that one is limited to a time factor; however, it is not such that one has to rush in getting the shot off. Recovery from recoil is not a factor that has to be considered either. However, in the slow-fire stage, one still has to establish all the ideal conditions in which to fire an accurate shot. There is little leeway as to time in order to establish these conditions. If one can develop the discipline of patience, he will be able to use this time factor to his advantage. Without patience, the shooter will tend to accept less than ideal conditions and attempt to fire the shot.

(2) The shooter with patience realizes that he may have to bench the pistol and restart the process three or four times on some

shots. Normal firing time of 1 minute per shot is adequate firing time. Even though he may take more than 1 minute on some shots, the overall time of 10 minutes for ten shots will prove to be sufficient.

(3) An example of a system for slow-fire stage is as follows:

(a) Extend arm and breathe.

(b) Find aiming area. (6 o'clock or center.)

(c) Pick up sight alignment.

(d) Settle into a minimum arc of movement.

(e) Take up the slack and apply initial trigger pressure.

(f) Hold breath.

(g) Maintain sight alignment and minimum arc of movement.

(h) Start positive trigger pressure.

(i) Concentrate eye focus on front sight.

(j) Surprise shot is fired.

(l) Follow through and call shot.

(4) Before firing the next shot, the shooter should review the elements of a good shot in his mind. He should not do this by looking at the target between shots. If he continuously stares at the target, he will also stare at it while delivering his next shot, thus causing him to lose his proper sight alignment. Because the human eye cannot focus on two objects simultaneously, it is impossible for the shooter to concentrate on the front sight and at the same time, look directly at the bull's-eye.

b. Timed and Rapid-Fire.--Many shooters are able to fire a good slow-fire score, but suffer a decrease in accuracy during the timed and rapid-fire stages. One thing to remember is that during timed and rapid-fire, all the fundamentals applied during slow-fire still apply. They are applied much faster and with recovery and rhythm.

(1) Producing good timed and rapid-fire scores takes considerable prior planning and mental preparation, since the time limits are 15 seconds per five rounds for rapid-fire and 20 seconds per five rounds for timed-fire.

(2) Up to this point, all the fundamentals of firing an accurate shot have been the same. However, two more steps must be added: recovery and rhythm. Recovery is the immediate action taken to bring the pistol and sights into alignment with the target prior to firing the next shot. Rhythm is the smoothness of the cycle of firing the five-shot string.

(3) In order to absorb recoil, the shooter must slightly increase the distance between his feet, lean into the pistol and tighten his entire body system. The shooter should feel relaxed but firm, without straining or trembling.

(4) The following is an example of timed and rapid-fire sequence:

(a) Extend shooting arm and breathe.

(b) Pick up sight alignment.

(c) Find aiming area on edge of target frame. (Final deep breath.)

(d) Settle into minimum arc of movement (wobble area).

(e) Concentrate eye focus on front sight. (Partly release breath.)

(f) Take up slack and apply initial trigger pressure.

(g) Maintain sight alignment. (Target faces.)

(h) Start positive trigger pressure.

(i) Concentrate on sight alignment. (First shot is fired.)

(j) Follow through and recovery with good sight alignment on each step.

(k) Recovery and rhythm.

(5) If the shooter has a good solid stance, correct position, a firm grip, and wrist and elbow locked, the recovery will be natural and uniform. Recovery must be accomplished as quickly as possible to allow more time for aligning the sights and applying trigger pressure.

(6) Developing a good rhythm is difficult, but absolutely necessary for good, consistent timed and rapid-fire scores. By planning to use a uniform technique, a sequence of actions, and careful timing for each shot, a good rhythm can be achieved.

(7) Some shooters find that mentally counting the shots as they are fired, helps them develop a good rhythm.

Section IV. SHOT ANALYSIS AND POSITIVE CORRECTIONS

7401. GENERAL

Complete and instantaneous shot analysis is a prerequisite for improvement in the shooter's performance. It is a waste of time and ammunition to stand on the firing line and fire haphazardly without any plan to improve. A mental impression of where the shot went and why should come at the instant the shot breaks. Corrective measures to prevent the reoccurrance of a poor performance must be instantaneously applied. Much has been written about why we shoot poorly; however, it is just as advantageous to analyze why a shooter is doing well on a particular day. It is more helpful to know the right way to perform than to have a shooter's mind cluttered with a multitude of "don'ts."

a. Cause of Bad Shots and Positive Corrections.--There are obvously a multitude of causes for bad shots. Listed below are those most frequently found. It is not intended to be a complete list nor is it intended to provide the shooter with a convenient list of bad habits. It is, however, intended to assist the shooter in finding the source of his troubles.

(1) Not Focusing on Front Sight.--This quite frequently is listed as "looking at the target." A shooter may be focusing his eye on neither the sights nor the target, but since he does not see the target in clear focus, he

assumes he is looking at the sights. He must concentrate on the front sight and maintain sight alignment while the shot is being fired.

(2) Holding Too Long.--Adverse conditions that interrupt a shooter's ability to "hold" may cause him to delay his trigger pressure, waiting for conditions to get better. The disturbing factor about this is that he will do it unconsciously; therefore, he must continuously ask himself, "Am I determined to apply positive pressure on the trigger even if the arc of movement enlarges as long as I have perfect sight alignment?"

(3) Improper Grip or Position.--Suffice to say that a shooter cannot fire a decent score with any weapon at any range if he continually fires under the handicap of a faulty position that pulls him to either side of the target or a grip that does not give him natural sight alignment.

(4) Jerk or Heel.--The application of abrupt trigger pressure with the trigger finger or in the case of the heel, flinching pushes the heel of the hand in a reflex action. This is caused by the need to fire quickly during the short duration of a sight picture or the sights passing near the target center. During a wind shot, sight alignment is much easier to maintain than a sight picture. Apply pressure to the trigger straight to the rear and wait for the shot to break.

(5) Anticipation.--Anticipation can cause muscular reflexes of an instant nature that so closely coincide with recoil that extreme difficulty is experienced in making an accurate call. Anticipation is also the sire to flinching.

(6) Loss of Concentration.--If the shooter fails in his determination to apply positive pressure on the trigger while concentrating on the front sight, his prior determination needs renewal and he should start over.

(7) Anxiety.--Anxiety is when a shooter works on getting a shot off, while building up in his mind the doubt that the shot will be good. Finally, he shoots it just to get rid of that particular round so he may work on the others.

(8) Vacillation.--This is a mental fault rather than a physical one. This results in the shooter accepting minor imperfections in some shots which could have been corrected if he had tried a little harder; the end result being he hoped he would get a good shot. By applying the same determination and techniques to every shot he fires, the resulting scores would reflect the uniformity of his performance.

(9) Lack of Followthrough.--Followthrough is the subconscious attempt to keep everything just as it was at the time the shot was fired; i.e., continuing to fire the shot even after it is gone. Followthrough is not to be confused with recovery. Merely recovering and holding on the target after the shot is fired is no indication that a shooter is following through.

(10) Lack of Rhythm.--This is hesitancy on the first shot or any subsequent shots in timed or rapid-fire. Develop a good rhythm with positive trigger pressure and employ it in every case. Frequently, many shooters will have fine rhythm until the last shot of a string and then hesitate, doctoring up that last shot for extra perfection. Time runs short, the target starts to turn, and the shot is jerked.

(11) Record Day Pressure.--If there are 50 shooters scheduled to qualify, there are 50 shooters suffering from some degree of "record day" pressure. If a shooter is exerting all his mental energy toward correctly executing the fundamentals rather than the probable results, his reward will be what he will feel when people congratulate him on a fine performance.

Section V. BASIC REVOLVER MARKSMANSHIP TRAINING

7501. GENERAL

The primary purpose of the revolver is to provide individual protection to aviators and other personnel armed with .38-caliber revolver when engaging an enemy at close quarters.

7502. DESCRIPTION AND CHARACTERISTICS

a. Description.--The .38-caliber revolver is a cylinder loaded, exposed hammer, selective double-action, hand weapon. There are four basic service revolvers in use by the U.S. military services (see fig. 7-20): two are 2-inch barrel, one made by Colt, the other by Smith and Wesson; two are 4-inch barrel, one made by Colt and the other made by Smith and Wesson. The 2-inch barrel weapons are used primarily by counter-intelligence personnel and the 4-inch barrel weapons are used by aviators.

b. Characteristics

(1) The revolving cylinder with five or six chambers permits firing five or six shots without reloading when using either the 2-inch or 4-inch barrel weapons. The action of cocking the hammer causes the cylinder to rotate (clockwise in Colt models; counterclockwise in Smith and Wesson models) and align the next chamber with the barrel. The exposed hammer may be cocked by the thumb or may be cocked and dropped by continuous squeezing of the trigger, which performs the double-action of cocking and releasing the hammer.

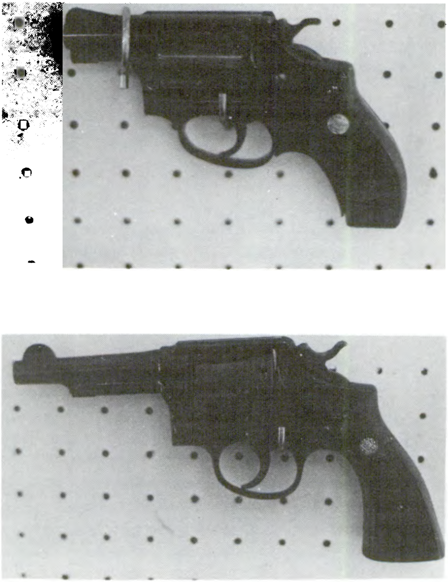


Figure 7-20.--Basic Service Revolvers.

(2) If one or more of the chambers are empty, the cylinder should be rotated so a loaded chamber will be moved into line with the barrel when the revolver is cocked. The closed cylinder may be rotated to its proper position by holding the hammer back about one-fourth full cock. With the hammer down, the first loaded chamber should be on the left (Colt) or right (Smith and Wesson) of the one aligned with the barrel.

7503. LOADING AND UNLOADING TECHNIQUES

a. Loading.--To load the revolver, hold it in the left hand, thumb latch to the left, with the muzzle pointed down at an angle of approximately 75 degrees. Press the latch (to the rear - Colt; forward - Smith and Wesson) with the right thumb and push the cylinder out with the fingers of the left hand. With the right hand, insert a cartridge into five chambers of the cylinder. Close the cylinder gently (do not slam shut) with the left thumb. Ensure that the empty chamber is in the topmost position. Using the nonshooting hand, grasp the revolver by the barrel and obtain the correct grip. While the use of five rounds is normal for range shooting, the revolver is safe with six rounds loaded. The Colt and Smith & Wesson use the hammer block system of safety to prevent the hammer firing pin from striking a round when the trigger is forward.

b. Unloading.--To unload the revolver, place it in the left hand, thumb latch to the left, with the muzzle pointed up an an angle of about 75 degrees. Press the latch with the right thumb (to the rear - Colt; forward - Smith and Wesson) and push the cylinder out with the fingers of the left hand. Eject the cartridges or cartridge cases by raising the left arm above shoulder level. Bring it down rapidly while pressing the ejector rod head with the left thumb. If the cartridges or cartridge cases do not fall out, remove them with the thumb and forefinger of the right hand. Inspect the cylinder to ensure it is clear.

7504. TRAINING

The fundamentals of revolver marksmanship are identical to those described in section II through IV of this chapter. There is, however, a slight deviation in procedures as they pertain to grip. Because of the configuration of the revolver and the method required to fire this weapon, slight alterations in the grip may be necessary. All other facets of training are applicable.

7505. FIRING

a. Keeping the muzzle pointed down range, place the revolver in the "V" of the shooting hand in the same manner as gripping the pistol. (See fig. 7-21.) The grip used for firing the

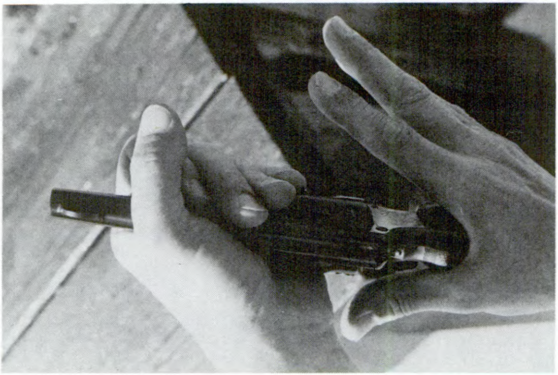


Figure 7-21.--Revolver of the "V" of the Shooting Hand.

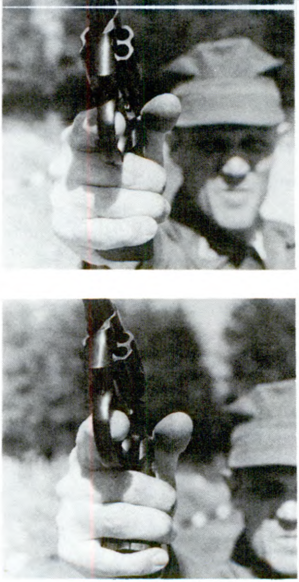
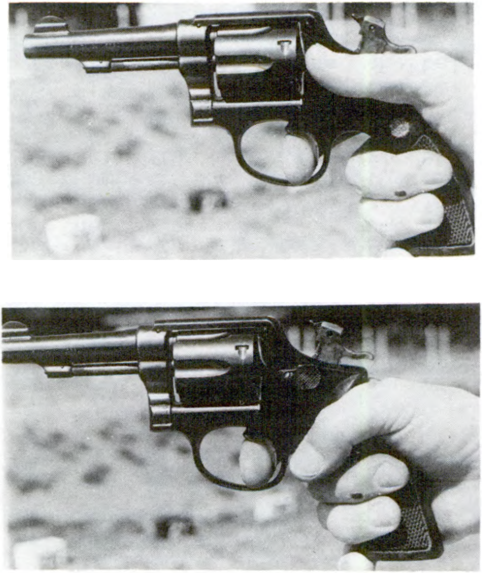

A
B

Figure 7-22.--Alternative Positioning of the Little Finger.

revolver (see fig. 7-22A) is essentially the same as for the pistol; however, some shooters obtain a more comfortable grip by curling the little finger beneath the butt of the weapon (see fig. 7-22B). The sharp, heavy recoil of the revolver may cause injury to the ball of the thumb when held high and against the cylinder release (see fig. 7-23A). Therefore, some shooters may find it necessary to rest the ball of the thumb on top of the middle finger (see fig. 7-23B).



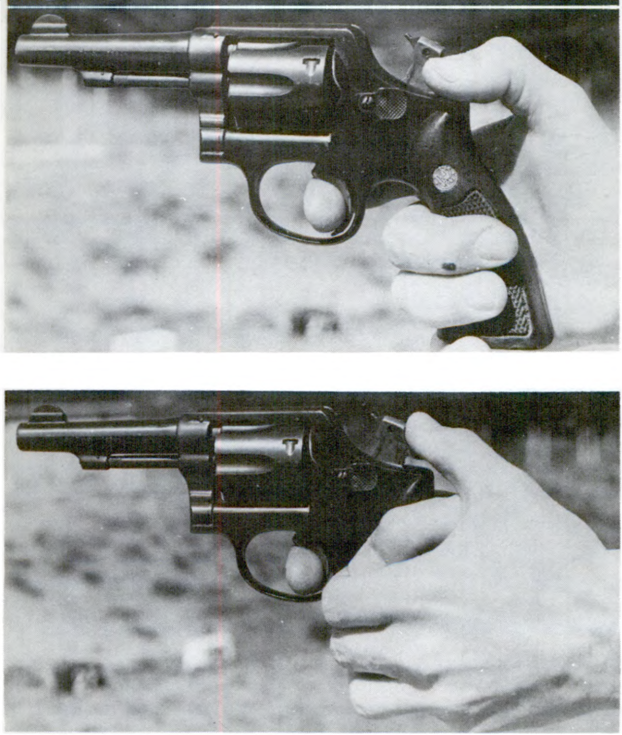
A

B

Figure 7-23.--Alternative Positioning of the Thumb.

All two-handed grips used with the .45-caliber pistol may be used when firing the revolver.

b. The revolver may be fired single action or double action. To fire single action, cock the revolver by pulling the hammer back with the thumb as far as it will go. Some shooters may experience difficulty maintaining uniformity in their grip while cocking the revolver for single action with the thumb of the



A

B

Figure 7-24.--Alternative Cocking Methods.

shooting hand (see fig. 7-24A). This can be overcome by cocking the revolver with the thumb of the supporting hand in two-handed shooting (see fig. 7-24B).

c. To fire double action, apply a steady rearward pressure to the trigger with the trigger finger until the hammer cocks and falls forward striking the primer of the cartridge. The trigger must be released after each shot and pulled again for each succeeding shot. The supporting hand should grip the shooting hand very tightly. The thumb of the supporting hand should press very hard into the shooting hand between the base of the thumb and the trigger finger (see fig. 7-25). Double action firing would normally be used only at very close range

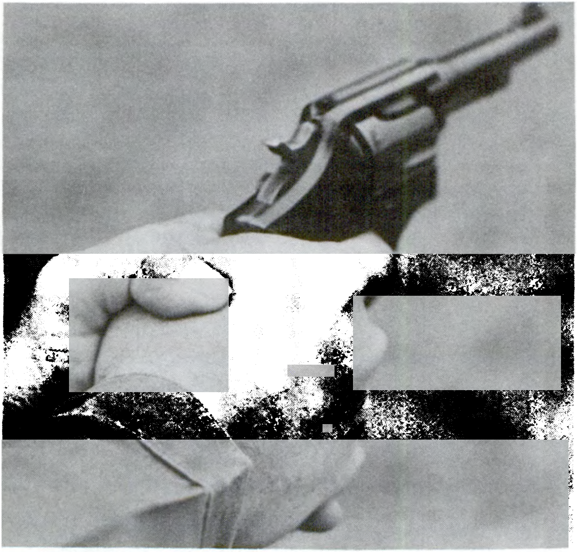


Figure 7-25.--Double Action Firing Grip.

in a combat situation. Requalification firing will not normally utilize the double action mode of firing the revolver. A smooth and steady trigger pull is absolutely essential to maintain reasonable accuracy while using the revolver in the double action mode.

RANGE SAFETY

Section I. SAFETY, RIFLE

1. GENERAL

The following paragraphs list the standard safety precautions to be observed during rifle marksmanship training. They have general application and must be supplemented by local regulations governing the operation of specific facilities.

2. MECHANICAL TRAINING

Prior to conducting mechanical training, the following precautions must be taken:

a. All rifles will be cleared.

b. A careful check of dummy rounds will be made to ensure that no live ammunition is present.

c. Toolboxes, spare parts boxes, or other containers in the vicinity of the training area will be checked to ensure that no live ammunition is stored therein.

3. RANGE FIRING

Prior to range firing, the following will be accomplished:

a. Dummy rounds will be checked to ensure no live ammunition is present.

b. Each rifle will be inspected by an officer, NCO, or coach to ensure there is no obstruction in the bore. Upon completion of firing, each rifle will be inspected to ensure that all live ammunition has been removed from the weapon.

c. Except while being used to conduct live or dry fire exercises, all rifles will have magazines removed, bolts open and locked to the rear, and safeties on at all times in any area where live ammunition is being used or is available.

d. When carrying a rifle on the range, the muzzle will be pointed upward and down range.

e. During live firing exercises, all rifles on the range will be presumed to be loaded. They must never be pointed at anyone or anything except the authorized targets.

f. During daytime live firing exercises, a red streamer will be displayed from a prominent location on the range.

g. Live firing will not be conducted until all prescribed roadblocks have been established and all necessary range guards posted.

h. Ammunition will be issued only on command from the control tower.

i. Rifles will be loaded (or simulated loaded) only on command from the control tower.

j. Prior to firing, all individuals including range personnel will be informed of the safety limits of the range.

k. When not being used, rifles will be placed in racks or in such a position as to be easily inspected to ensure bolts are open and safeties engaged.

l. Dry firing will not be conducted in the rear of the firing line on any range where live firing is in progress. Dry firing may be conducted on any designated and approved dry firing range. Dry firing on the firing line during the conduct of live firing, when firing points are available, may be authorized by the range officer.

m. Personnel will not move forward of the firing line until given clearance by the officer in charge or line NCO.

n. Anyone observing an unsafe condition during firing exercises is authorized to give the command, CEASE FIRING. When this command is given, it will be relayed immediately to the line NCO who will command CEASE FIRING AND LOCK, or CLEAR AND LOCK, as appropriate. The range officer is then responsible for investigation of the unsafe condition and taking necessary corrective action.

4. PIT OPERATIONS

The safety procedures used in the operation of the pits are as follows:

a. The command to commence firing will not be given until clearance has been received from the pit officer/NCO.

b. Target operators will remain at their targets unless they have been granted permission to leave by supervisory personnel.

c. No one will leave the pits until clearance has been granted by the officer/NCO in charge of the range.

d. Target operators must not expose any part of their bodies above the protective berm while marking or otherwise handling the targets and target frames.

1. GENERAL

Safety precautions with the live firing of all small arms are similar. Those safety areas peculiar to pistols and revolvers are covered in the following paragraphs. Section I applies unless modified below. These precautions have general application and must be supplemented by local regulations governing the operation of specific facilities.

2. MECHANICAL TRAINING

In addition to those items in section I, special emphasis should be placed on nomenclature, safety devices, and functioning.

3. RANGE FIRING

In addition to those items applicable in section I, the following should be accomplished prior to firing:

a. While the shooter is on the firing line, ensure procedures to report a malfunction are clearly understood. The shooter always remains facing the target when reporting a malfunction.

b. Except while being used to conduct live or dry firing exercises, all pistols will have the magazine's removed, slides locked to the rear, and chambers empty. Revolvers will have cylinders open and all chambers empty.

c. When carrying the pistol or the revolver on the range, the position of raised pistol will be used.

d. Weapons will be handled only upon command of the center of the line. Unless commands are given to handle weapons, all weapons will be made safe and placed on the live firing benches, muzzles pointed down range.

4. PIT OPERATIONS

No one will be allowed into the pit area to score or repair targets except as instructed by the center of the line.

APPENDIX B

STANDARD FIRING LINE COMMANDS

1. GENERAL

The following paragraphs list the standard firing line commands to be used on all rifle ranges. The line NCO will give only these commands unless safety regulations are being violated, or when otherwise directed by the range officer. The known distance course of fire is outlined to familiarize the individual firing with the scoring system, sequence of fire, magazine loading, and classification scoring.

2. COMMANDS

a. "This will be the (practice, preliminary, record) stage of the (KD, B, etc.) course."

b. "First relay on the firing line. Second relay on the ready line."

c. "This will be the first, (second, third, fourth, fifth) stage. ___rounds (standing, kneeling, sitting, prone) position. Time limit ___(seconds, minutes)."

d. "Firing line, with one round (magazine and ___rounds), lock and load."

e. "Is the line ready?" (Check block NCO's, coaches for signal.) "The line is ready." (Or, "The line is not ready.")

f. "Ready on the right?" (Check block

NCO's, coaches for signal.) "Ready on the left?" "All ready on the firing line."

g. (Slow fire) "You may commence firing when your target appears."

h. (Rapid fire) No command is given; time is controlled from the pits.

i. "Cease firing; bolts open, clear, and lock all weapons."

j. "Block NCO's, coaches. Are there any alibis?" (Alibis will be reported to the line NCO by target number. Issue instructions regarding alibi relay, if any.)

k. "Is the line clear?" (Check block NCO's, coaches for signal.)

l. "The line is clear." (Or, "The line is not clear.")

m. "Shooters, pick up your brass," (depending on specific range requirements).

n. "Second relay on the firing line, third relay on the ready line."

o. (Rapid fire) "Shooters and scorers or coaches, stand by to receive scores, groups."

NOTE: Repeat above procedure until all relays have fired the stage.

3. KNOWN DISTANCE COURSE OF FIRE

a. <u>Scoring System</u>.--A value of five points

will be awarded for any shot within or touching any portion of the bull's-eye of the "A" target or the silhouette or bull's-eye shall be recorded with the point value indicated by the shot hole; being a four or three. Shot holes outside the largest scoring ring (3), but on the target paper, will be scored as a two. Any shots striking the line between two values, however slight, will be scored with the highest value. Any shot hole outside the target paper area will be scored and disked as a miss.

b. Sequence of Fire.--(See fig. B-1.)

c. Magazine Loading.--For stages 4 and 6, two magazines with five rounds each. The shooter will be required to change magazines and reload his rifle from the cartridge belt. Personnel will load five rounds in each magazine for slow-fire stages 1, 2, 3, and 5.

STAGE	RANGE	TIME	ROUNDS	TARGET	POSITION	SLING
1	200 YDS	5 MIN	5	"A"	SITTING	LOOP
2	200 YDS	5 MIN	5	"A"	KNEELING	LOOP
3	200 YDS	5 MIN	5	"A"	STANDING	PARADE
NOTE: THE ABOVE STAGES SHOULD BE FIRED IN THE SEQUENCE INDICATED AND EACH RELAY IS ALLOWED 20 MINUTES TO COMPLETE THREE STAGES OF FIRE.						
4	200 YDS	60 SEC	10	"D"	STANDING TO SITTING	LOOP
5	300 YDS	5 MIN	5	"A"	SITTING	LOOP
6	300 YDS	60 SEC	10	"D"	STANDING TO PRONE	LOOP
7	500 YDS	10 MIN	10	"D"(MOD)	PRONE	LOOP

Figure B-1.--Sequence of Fire.

d. Shooter's Position on the Firing Line.--When engaged in firing on the range, the shooter will take his position on the firing line to the right of the number block, indicating his target assignment.

e. Classification Scoring

(1) Yards
- (a) Expert: 220-250.
- (b) Sharpshooter: 210-219.
- (c) Marksman: 190-209.

(2) Meters
- (a) Expert: 216-250.
- (b) Sharpshooter: 206-215.
- (c) Marksman: 186-205.

APPENDIX C

MAINTENANCE, CLEANING, AND INSPECTION

Section I. M16A1 RIFLE

1. MAINTENANCE

The M16A1, like any other weapon when in daily use, requires continuous attention (care and cleaning) by the user. The importance of prescribed maintenance and operating procedures cannot be overstressed. In view of the above, this appendix was prepared for use in M16A1 training and discusses the following specific subjects: user and organizational maintenance; proper care and cleaning procedures; and proper inspection procedures.

a. Preventive Maintenance.--Preventive maintenance is the systematic care, inspection, and servicing of weapons to maintain them in operating condition, prevent breakdowns, and assure maximum operational readiness. Further, it is that maintenance authorized for, performed by, and the responsibility of the using organization on weapons in its possession. It is the first link in the chain of maintenance and is the one most often broken, either through neglect or lack of knowledge of the weapon. It is the user's responsibility to properly clean his weapon and report promptly any broken, worn, or malfunctioning parts. Prompt attention in reporting discrepancies will expedite repair or replacement of parts and prevent serious malfunctions at a later date.

b. User Maintenance.--User maintenance consists of care and cleaning of the weapon as outlined in paragraph 2.

c. Organizational Maintenance.--Organizational maintenance is performed by unit ordnance personnel (battalion/squadron armorer) and consists of care, cleaning, second echelon repairs, and transportation of weapons to the next higher echelon of maintenance when required. The following second echelon maintenance parts are authorized to be replaced by second echelon maintenance personnel:

(1) Pin, firing, retaining.
(2) Pin, firing.
(3) Pin, bolt cam.
(4) Pin, extractor.
(5) Extractor, small arm cartridge.
(6) Spring, extractor.
(7) Pin, spring (ejector).
(8) Ejector, small arms cartridge.
(9) Spring, ejector, and selector lever detent.
(10) Handle, charging.
(11) Pin, pivot.
(12) Screw, machine (pistol grip).
(13) Washer, flat (pistol grip screw).
(14) Grip, pistol.
(15) Screw, butt cap.
(16) Stock assembly, molded.
(17) Sling, small arms: M1.
(18) Spring, detent, takedown pin.
(19) Detent, takedown pin.
(20) Pin, takedown.
(21) Guard, hand, gun: R.H.
(22) Guard, hand, gun: L.H.

2. CARE, CLEANING, AND LUBRICATION OF THE M16A1 RIFLE

Normal care and cleaning will ensure proper functioning of all parts of the weapon. Improper maintenance causes stoppages and malfunctions. Only bore cleaner and cleaning solvent which is available through the supply system should be utilized. Cleaning materials are carried by the rifleman in the bipod case. Lubrication instructions in paragraphs 2b, c, and d apply to garrison situations. The lubrication instructions in paragraph 2e are for use in a combat environment.

a. <u>Care and Cleaning of the Rifle</u>

(1) Inspect and clean your rifle thoroughly each day.
(2) Inspect and clean magazines daily.
(3) Use authorized cleaning materials and lubricants only.
(4) Do not perform any unauthorized maintenance.
(5) Do not make any unauthorized modifications.
(6) Do not use flash suppressor as a tool.
(7) Do not attach jungle slings to front sight assemblies.
(8) Do not tape magazines together.
(9) Do not leave ammunition in the chamber for prolonged periods; it tends to corrode the chamber.
(10) Inspect and clean ammunition daily; watch for corrosion.
(11) If your rifle gets wet, dry and lubricate as soon as possible.

(12) Insert cleaning gear from chamber end only. This helps to preserve the lands and grooves in the rifle and ensures accuracy.

b. <u>Cleaning and Lubrication of the Upper Receiver Group</u>

(1) Using the bore brush saturated with bore cleaner, brush the bore thoroughly, using straight-through strokes from the chamber end to muzzle end. Push the brush through the bore until it extends beyond the muzzle. (See fig. C-1.) (Never reverse the direction of the brush while in the bore. This will rapidly destroy the brush.)

(a) CAUTION: If this procedure is not followed, the bore brush could become jammed in the bore.

(b) The cleaning rod is to be supported by hand, a section at a time, to

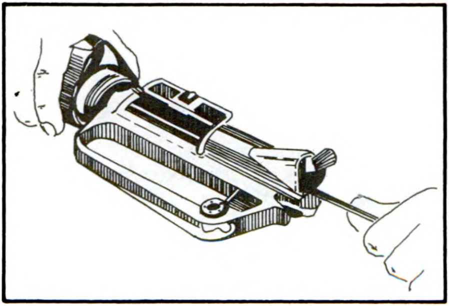


Figure C-1.--Cleaning the Bore.

prevent flexing and damage to the rod when starting into the bore.

(2) Using patches, dry the bore thoroughly. Remove the patch before reversing direction of the cleaning rod. If only .30 caliber patches are available, cut into four equal parts and use only one part.

(3) Clean chamber and barrel extension using the chamber cleaning brush saturated in bore cleaner. Make sure chamber and barrel extension are free of carbon, powder residue, and foreign matter. It may be necessary to use a small bristle brush to assist in cleaning locking recesses in the barrel extension. No bristle brush is issued; however, a toothbrush can be used. Wipe the chamber and barrel extension clean and dry. (See fig. C-2.)

(4) Clean the interior of the receiver using a small bristle brush. Clean the exterior of the gas tube by scrubbing with a bore brush and bore cleaner. Scrub the halfmoon recess next to the tube to ensure it is free

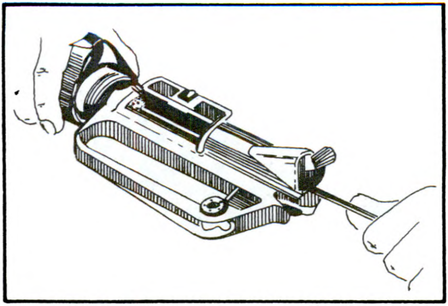


Figure C-2.--Cleaning the Chamber.

of carbon deposits and debris. DO NOT CLEAN THE INTERIOR OF THE GAS TUBE. (See fig. C-3.)

(5) Using lubricating oil, semi-fluid, MIL-L-46000A (LSA), apply a thin film to the internal and external surfaces of the upper receiver and barrel including under the hand guards, bore, chamber, barrel extension, and locking lugs. The charging handle should also have a thin film of LSA. Work several drops of LSA into the forward assist assembly.

c. Cleaning and Lubricating the Bolt Carrier Group

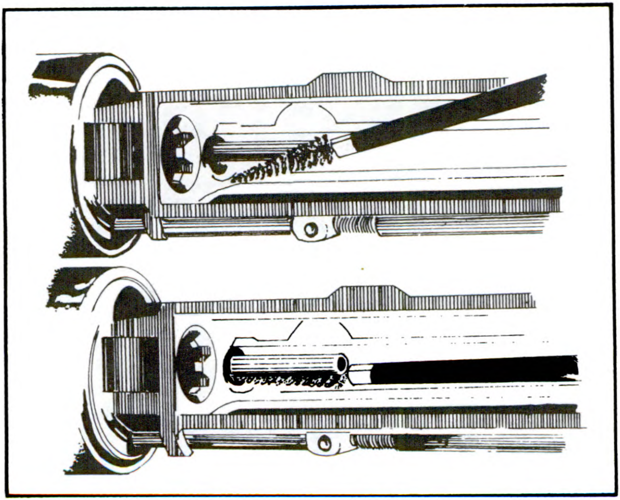


Figure C-3.--Cleaning the Interior of the Receiver.

(1) Definitions for the amount of LSA specified are listed below:

(a) One Drop.--Dip the end of the swab holder section into lubricant and allow one drop to fall from the tip.

(b) Light Coat.--Apply lubricant to a cloth until it becomes just damp enough so the oil cannot be squeezed from the cloth. When applied, the part will have a film of lubricant which is barely visible.

(c) Generous Coat.--Apply lubricant to a cloth until it becomes saturated and the oil can be squeezed from the cloth. When applied, the part will have a film of lubricant heavy enough to be spread with the finger.

(2) Disassemble bolt from carrier down to authorized level of maintenance. Using a small bristle brush and bore cleaner, scrub all carbon and dirt from the bolt, locking lugs, extractor claw, and bolt rings. No abrasives are to be used. Check the extractor and ejector for good spring tension. BOLT RING GAPS MUST BE STAGGERED.

(3) Scrub carrier key using a bore brush and bore cleaner inside and out. (See fig. C-4.) Clean firing pin with patch and bore cleaner; the area forward of the front shoulder must be free of carbon or burrs. The firing pin must not be bent. (See fig. C-5.) Gas relief ports on right side of carrier must be free of any obstruction. Use patch and bore cleaner to clean the rest of the carrier. Wipe all parts dry and apply a thin film of LSA on all parts of bolt and bolt carrier. Apply one drop of LSA inside the carrier key and one drop in each of the gas relief ports. (See fig. C-6.) EXCESSIVE LUBRICATION OIL IN THE FIRING PIN

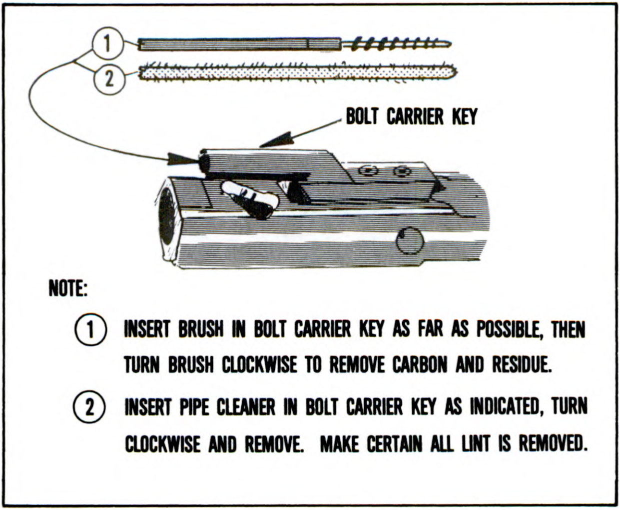


Figure C-4.--Cleaning the Carrier Key.

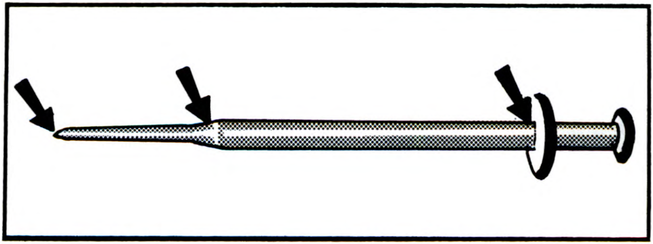


Figure C-5.--Firing Pin.

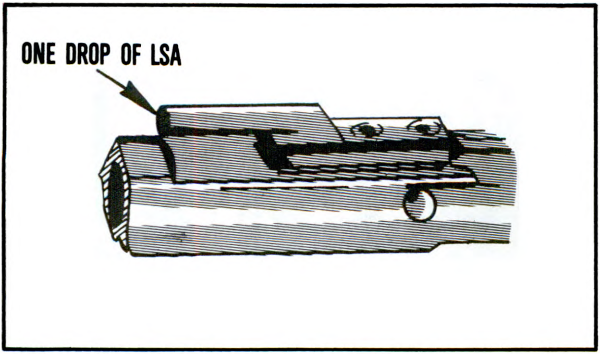


Figure C-6.--Lubricating the Carrier Key.

RECESS OF THE BOLT MAY RESULT IN A LIGHT STRIKE ON THE PRIMER, THEREBY CAUSING A MISFIRE. AVOID EXCESSIVE OIL ON COMPONENTS SUBJECTED TO CARBON DEPOSITS.

d. Cleaning and Lubricating the Lower Receiver Group

(1) Disassembly of the lower receiver group is not authorized at the first echelon of maintenance (user); however, by using a small bristle brush and patches, it may be cleaned adequately.

(2) Brush as thoroughly as possible, wipe all portions with a patch and bore cleaner, then wipe dry.

(3) Using LSA, apply a thin film to the internal and external surfaces of the lower receiver, the firing mechanism, the action spring and guide, and the lower receiver extension.

e. Lubrication Recommended for a Combat Environment

(1) Excessive lubrication only contributes to weapon malfunctions and does not eliminate the need for daily cleaning. The following is a guide for lubrication. LSA should be applied in a very thin film to the following parts:

(a) Shank of bolt cam pin.

(b) Bolt carrier rails.

(c) Hammer cam surface of bolt carrier.

(d) One drop in each of the two gas relief ports on the bolt carrier.

(e) One drop in the bolt carrier key.

(f) One drop on each pin end in the lower receiver group as required; will be required more frequently during wet weather or after submerging.

(g) One drop on selector lever, and spring, when required to prevent selector from freezing.

(2) If LSA is not available for lubrication, the following procedures are acceptable:

(a) Apply lubriplate in a VERY THIN FILM to the following points:

1 Shank of bolt cam pin.

2 Bolt carrier rails.

3 Hammer cam surface of bolt carrier.

(b) Apply preservative oil, PL special, as follows:

1 One drop in each of the two gas relief ports on the bolt carrier.

2 One drop in the bolt carrier key.

3 One drop on each pin end in the lower receiver group as required; will be required more frequently during wet weather or after submerging.

4 One drop on selector lever, detent, and spring as required to prevent selector lever from freezing.

f. Care and Cleaning of Ammunition

(1) When necessary to store ammunition in the open, raise it on dunnage at least 6 inches from the ground; protect it with a cover but leave enough space for circulation of air.

(2) Ammunition is adversely affected by moisture and high temperature; do not open boxes until ammunition is to be used. Ammunition removed from airtight containers, particularly in damp climates, may corrode. Protect ammunition from high temperatures and the direct rays of the sun. More uniform firing is obtained if rounds are of the same temperature.

(3) Do not attempt to disassemble the cartridge or alter any of its components.

(4) The use of oil or grease on cartridges is prohibited.

(5) Ammunition should be protected from sand, mud, moisture, frost, snow, ice, grease, corrosion, and all foreign matter. Wet, dirty, or lightly corroded ammunition may be cleaned with a clean, dry cloth.

(6) Brass cartridge cases are easily dented and should be protected from hard knocks and blows.

(7) Twenty-round paper cartons deteriorate when wet and adhere to cartridges.

(8) Inspect all ammunition prior to loading into magazines. Do not use ammunition which is dirty, corroded, dented, or has a loose bullet.

g. Care, Cleaning, and Lubrication of Magazines

(1) Carefully disassemble the unloaded magazine.
(2) Thoroughly scrub the inside of the magazine and the follower with a brush or rag soaked in rifle bore cleaner.
(3) Dry all parts of the magazine with a clean, dry cloth.
(4) Inspect follower spring. If it is not broken or deformed, apply a light coat of LSA to the spring only. (No other lubrication is required or authorized.)
(5) Reassemble magazine.

h. Water in Bore.--If the rifle is fired with water in the bore, the excessive pressures generated can damage the barrel and possibly injure the individual. During the rainy season or after fording a stream, take the following precautions prior to firing:

(1) Point the muzzle down.
(2) Pull the charging handle back slightly so that air can enter and let the water out.
(3) Press the forward assist to reseat the round and lock the bolt in the firing position.

3. INSPECTION PROCEDURES

Inspections have definite functional values. The M16A1 rifle cannot be completely inspected while assembled. The serviceability of the weapon cannot be determined unless the weapon is field stripped. When the situation permits, the weapon should be entirely field stripped and inspected as follows:

a. Upper Receiver

(1) Inspect overall finish and flash suppressor for looseness.
(2) Inspect bore and chamber. They must be free of powder residue, carbon buildup, and foreign matter.
(3) Inspect the locking recesses in the barrel extension for carbon buildup, chips, or cracks around recesses.
(4) Inspect interior of receiver, exterior of gas tube, and the half-moon recess next to gas tube, making sure they are free of carbon deposits. The gas tube must not be bent or crimped.
(5) Inspect front and rear sights for freedom of movement.
(6) Check handguards for cracks and loose heat shields.
(7) Inspect gas tube for dents or crimps. GAS TUBE IS BENT TO CONFORM TO BARREL TAPER. DO NOT ATTEMPT TO STRAIGHTEN GAS TUBE.

b. Lower Receiver

(1) Inspect overall finish, butt stock, and pistol grip for cracks and looseness.

(2) Inspect bolt catch and magazine catch for freedom of movement.

(3) Check selector lever freedom of movement. Selector spring must not be cut or broken.

(4) Inspect takedown and pivot pin to ensure they will not come free of receiver.

(5) Check automatic sear for excessive wear or damage (top and bottom plus sear spring).

(6) Function check firing parts for proper assembly, operation, and excessive wear.

c. Bolt Carrier Group

(1) Check carrier key to ensure it is tight and free of carbon.

(2) Check carrier to ensure it is free of carbon deposits, cracks, and fractures and that the cam pin track has no excessive wear.

(3) Inspect bolt; it must be free of carbon deposits, nicks, and burns. Inspect the extractor claw for chips and cracks.

(4) Inspect the extractor and ejector for spring tension.

(5) Make sure locking lugs are free of burrs, cracks, and fractures.

(6) Inspect bolt rings for chips and cracks. They must be clean and gaps are to be staggered.

(7) Inspect firing pin for damage and excessive wear. Make sure firing pin is free of carbon and is not bent. Check for freedom of movement and protrusion through the face of the bolt.

(8) Inspect charging handle for excessive wear and latch for spring tension.

d. Followup Procedures.--In addition to the above list, the weapon should be inspected for proper care and cleaning as described in paragraph 2. Any defects in the weapon that are noted must be brought immediately to the attention of your unit ordnance personnel for repair. CAUTION: Failure to do so will negate the usefulness of the inspection.

Section II. PISTOL AND REVOLVER

1. CARE, CLEANING, AND LUBRICATION OF THE PISTOL AND REVOLVER

Normal care and cleaning will ensure proper functioning of all parts of the weapon. Improper maintenance causes stoppages and malfunctions. Cleaning materials and tools should be readily available to the shooters. Cleaning the weapons after firing is considered essential and should be accomplished by the shooters as training. If close supervision is necessary, it should be provided.

a. Safety Devices.--The safety devices on the pistol and revolver should be checked frequently to ensure proper function. Any discrepancies should be repaired before the weapon is again issued for firing.

(1) Pistol, M1911A1.--The pistol has three safety devices: the grip safety, safety lock, and half cock notch. The disconnector provides an additional safety feature, but it is not considered a positive safety since it is designed to cause the pistol to fire semiautomatically and cannot be controlled by the firer.

(2) Revolver.--The revolver has two safety devices. These devices are the safety and the cylinder bolt.

(a) The safety prevents the hammer from striking the primer of a cartridge by blocking the hammer and preventing it from moving forward enough to strike the primer of the cartridge. The safety blocks the hammer each time the trigger is released.

(b) The cylinder bolt, another safety device, ensures positive alignment of one of the chambers of the cylinder with the barrel each time the cylinder rotates.

(3) Procedures for testing these safety devices are found in FM 23-35, Pistols and Revolvers.

b. Cleaning and Lubrication

(1) Pistol, M1911A1, Before Firing.--Before the pistol is fired, the bore, chamber, and interior parts of the receiver are cleaned and dried. The guide rails on the receiver and the grooves on the slide are lubricated with oil. A light coat of oil is left on all interior metal parts except those that come into contact with ammunition. Excess oil is removed from the grips and the grip area of the receiver to aid the firer in maintaining a proper grip on the weapon.

(2) Pistol, M1911A1, After Firing.--The pistol must be cleaned as soon as practicable after firing.

(a) Disassemble (field strip only).

(b) Clean all parts with a rag lightly saturated with oil. Dry all parts and apply a light coat of oil.

(c) Clean the bore and chamber thoroughly using cleaning rod, wire brush, bore cleaner, and patches. Dry thoroughly and inspect. If not free of all residue, repeat cleaning procedure with wire brush. When chamber and bore are clean, coat with a lubricating oil.

(d) Assemble.

(e) Test for proper assembly.

(f) Apply a light coat of oil to exterior surfaces.

(g) Inspect and clean thereafter as necessary.

(3) Revolver, Before Firing.--Before the revolver is fired, the bore and chambers must be cleaned and dried. The exterior should be dried to remove excess oil. The cylinder and ejector rod inside the cylinder should be lightly oiled and a drop or two of oil should be placed on the interior parts to ensure proper functioning. It is not necessary to disassemble the revolver to apply oil to the interior. Disassembly of the revolver should be accomplished only by an armorer.

(4) Revolver, After Firing.--Do not disassemble. Clean bore and chambers with proper materials as for the pistol. Coat lightly with oil and clean as necessary thereafter.

CHECKLIST FOR COACHES

1. GENERAL

The following paragraphs establish a checklist to assist the coach in the performance of his duties.

2. BEFORE REPORTING TO THE FIRING LINE

a. Receive instructions from NCO in charge.

(1) Special instructions (help with ammo, light smudge pots, run up flags, etc.).
(2) Target assignment, course of fire.

b. Check personal equipment (pencil, notebook, stool, field jacket, etc.).

c. If taking over targets of another coach, get shooters' names and a quick evaluation of each shooter from previous coach.

d. Discuss with other coaches the weather conditions (direction and amount of wind, etc.).

3. AFTER REPORTING TO THE FIRING LINE

a. Muster shooters in accordance with local procedures.

b. When on the ready line prior to firing (time permitting), minimize mental anxiety and human error by talking to and checking the shooters on:

(1) Course of fire.

(2) Firing procedure.

(3) Equipment check to include loose sights, broken stocks, proper lubrication, bore clear of obstructions, correct number and condition of magazines, and web gear.

(4) Weather conditions.

(5) Data book analysis.

(6) Be sure sights are blackened BEFORE moving on the firing line.

c. On the firing line:

(1) Help shooters find suitable location on firing line.

(2) Have shooter check sight setting to be used.

(3) Remind shooter of his target number.

(4) Have shooters dry fire a few rounds to check position and natural alignment.

(5) Remind shooter to comply with safety precautions.

d. During firing:

(1) Watch shooter, not target.

(2) Check shooter to see that he applies the correct methods of:

(a) Sighting and aiming.

(b) Positions.

(c) Trigger control.

(d) Rapid fire procedure.

(e) Sight adjustments.

(f) Correcting the effects of weather.

(g) Zeroing.

(h) Use of data book.

(1) Ensure that weapons are clear and collect excess/unused ammo, if any.

(2) Have shooter police firing line.

(3) Confirm elevation and windage used.

(4) Analyze performance and confirm or establish zeros with the shooter.

(5) Issue necessary instructions for next stage of fire to shooter.

APPENDIX E

RECORD DAY SUPERVISORY MARINES

1. GENERAL

Commanding officers responsible for the conduct of record firing assign supervisory Marines in the pits. The problems and confusion encountered by the pit verifiers will be greatly reduced by having a thorough knowledge of their duties and responsibilities. The range officer will normally conduct a briefing of the verifiers immediately prior to their assumption of duty.

2. PIT OFFICER

One officer or senior staff noncommissioned officer (master sergeant or above) will be in charge of the pits.

3. PIT BLOCK OFFICERS

One officer or staff noncommissioned officer to each group of 10 targets will supervise marking and scoring of targets in his block.

4. PIT OFFICER RESPONSIBILITIES

The officer in charge of the pits will be responsible to the range officer for enforcing all pit regulations, ruling on all controversies pertaining to the value of hits, number of hits and time limits, and controlling all information received or passed over the communication system between the pits and the firing line.

a. Assigns pit block officers to specific blocks of targets.

b. Closely supervises pit block officers in the performance of their duties and assists in spot checking targets for proper operation, including marking and disking the proper value and entering the score properly on the pit scorecard.

c. Performs other requirements enumerated by the range officer during his briefing which would be peculiar to the range complex.

d. Be thoroughly familiar with scoring requirements enumerated in MCO 3574.2_.

e. Is encouraged to consult with the range officer at any time to resolve questionable matters. This will reduce the number of discrepancies to be resolved when the line and pit scorecards are matched.

f. Remain with pit block officers after firing to explain the circumstances involving possible discrepancies between line and pit scorecards. Normally, this function will be accomplished at the S-3 office.

5. PIT BLOCK OFFICERS DUTIES

One pit block officer will be assigned to a block of 10 targets. Each will be guided in the performance of his duties by range regulations, the range officer's briefing, and the directions of the pit officer. All pit block officers will be responsible to the pit officer for the performance of their duties. While the specific

procedures may vary between range complexes, the following will guide them in performing their duties in a professional and competent manner:

a. Brief the target operators and scorekeepers before commence fire as to the specific procedures required of them.

b. Scorecards and entries made on the scorecards will cause the most problems. Initially, ensure all required information is entered; date, target number, relay number, scorekeeper's identifying information, and block officer's name. Double check legibility.

c. Do not erase entries on the card. Corrections on scorecards should be made by drawing a single line, diagonally through the incorrect score. Write the correct score in at any convenient place immediately adjacent to the lined out score and have the block officer initial correction. For rapid fire, a single line through the entire row of numbers is sufficient. Write in the correct score and initial the correction. Use the back of the scorecard if necessary. Should a correction be made that may later need to be explained, write a short answer on the back side of the card. This may be a sufficient answer for the S-3 officer or will aid the pit block officer in remembering the circumstances causing the discrepancy, thereby resolving the matter confidently.

d. To ensure the cards are turned in, in a timely manner, they should be verified after each stage as each relay completes firing. At the completion of firing, this would leave only

two scores to be verified: the 500-yard stage and the grand total.

e. As each relay completes firing at 500 yards, verify the accuracy of the addition for the stage and total; collect each block of cards in numerical order and submit to the pit officer.

f. During rapid fire stages, instruction should be given the scorekeepers to not write in the score until they are sure there is no alibi or refire for that shooter. This will save considerable confusion as rapid fire requires verification of insufficient and excessive hits for all targets almost at the same time. Considerable confusion will be eliminated by not having target operators calling for a verifier for numbers of hits and value and at the same time, have scorekeepers needing corrections on scorecards.

g. Continuous and vigorous spot checking of target operation and recording of the score is necessary. Spot check shots on targets for value and score recorded. Observe speed of target operation, keep target operators alert, and time them if necessary. From the time a shot strikes the paper until it is marked, raised back in the air, and disked should require no more than 20 seconds. A time of 10 seconds is easily attained and should be encouraged.

h. Alibis that occur on the firing line are normally highly visible and immediately brought to the attention of the line block officer or range officer. This is not true of errors committed in the pits. General rules and courses of

action are listed below:

(1) Sighting shots are prohibited except as authorized by competent authority.

(2) Each shot fired on the wrong target will be scored as a miss.

(3) Ricochets will be counted as misses. A projectile that goes through the target sideways is not necessarily a ricochet. If it is not obvious the projectile ricocheted off the butts or caused dirt to fall into the pits, the shot should be scored the value of the scoring ring hit.

(4) If insufficient hits occur during rapid fire and no excessive hits on adjacent targets appear, notify the pit officer immediately by stating "Insufficient hits, target (number)." Stand by for the reply. This could have been caused by a weapon alibi on the line or a shooter firing too slowly. While standing by for reply, inspect target. If target operator has placed spotters in shot holes before verifier has inspected target and shooter did not save a round, he has caused a pit alibi due to improper pit procedure. Pit officer should be informed and shooter should refire string.

(5) If there are insufficient hits during rapid fire and there are excessive hits on adjacent targets, action should be the same as for (4) above. This is normally caused by at least one shooter firing on wrong target.

(6) If excessive hits occur during slow fire or if two or more shots strike the target at approximately the same time and are not of the same value, the shot with the highest value will be recorded. Spotters will be placed in all shot holes. The pit officer need not be notified.

(7) If excessive hits occur during rapid fire or if a target has more than the prescribed number of hits, all of the same value, the target will be scored with the value of the number of shots actually fired by the individual. In this case, the pit officer need not be informed. If the target has more than the prescribed number of hits, not all of the same value, the target will not be marked and the individual will be required to refire the entire string. In this case, the pit officer must be informed, "Excessive hits, target (number), not of the same value, pit alibi," and he, in turn, notifies the line.

(8) If a target is withdrawn just as a shot is fired in slow fire, or before the time limit has expired in rapid fire, the shooter will be allowed to refire the shot in slow fire, or the entire string in rapid fire, as appropriate. It must be substantiated, however, that the target was withdrawn prematurely.

APPENDIX F

FIELD FIRING RANGES

Section I. GENERAL

1. Two typical field marksmanship courses are outlined in this appendix. Although range facilities and firing procedures prescribed for these courses may differ from those for other courses, the fundamentals of marksmanship and the techniques for teaching these fundamentals are the same. Consequently, the principles and techniques outlined in chapters 2, 3, 4, and 5 should be followed as closely as possible regardless of the course of fire being conducted.

2. Each course is designed to develop in the individual rifleman certain abilities; however, in both courses, the rifleman should have completed preparatory marksmanship training, known distance firing, and instructions in the following field firing subjects before firing:

a. Target detection.

b. Range estimation.

c. Application of battlesights.

d. Engaging targets (leads).

e. Time element in engaging a target.

f. Field firing positions.

g. Assault fire.

h. Night firing.

3. The courses described are not designed for night firing; however, this should not preclude instructional type training in the correct techniques of night firing as discussed in chapter 5.

Section II. FIELD RANGE COURSE, PROCEDURES AND REQUIREMENTS

1. FIELD RANGE COURSE

This typical field marksmanship course (see fig. F-1) is designed to develop in the individual rifleman the ability to apply the correct techniques on the subjects outlined in paragraph 2a through 2g in section I. The course of fire is as prescribed on the field range scorecard in figure F-2.

2. CONDUCT OF FIRE

The recommended procedure to fire the course is as follows:

a. Order of Fire.--Each firing lane has seven firing positions. The order of fire is:

(1) Barricade.
(2) Rooftop.
(3) Rubble pile.
(4) Stump.
(5) Log.
(6) Foxhole.
(7) Assault.

b. Division of Firing Detail.--The firing detail is divided into relays of five men each, with each assigned one fire lane.

c. Coaches.--A minimum of one coach is required for each fire lane.

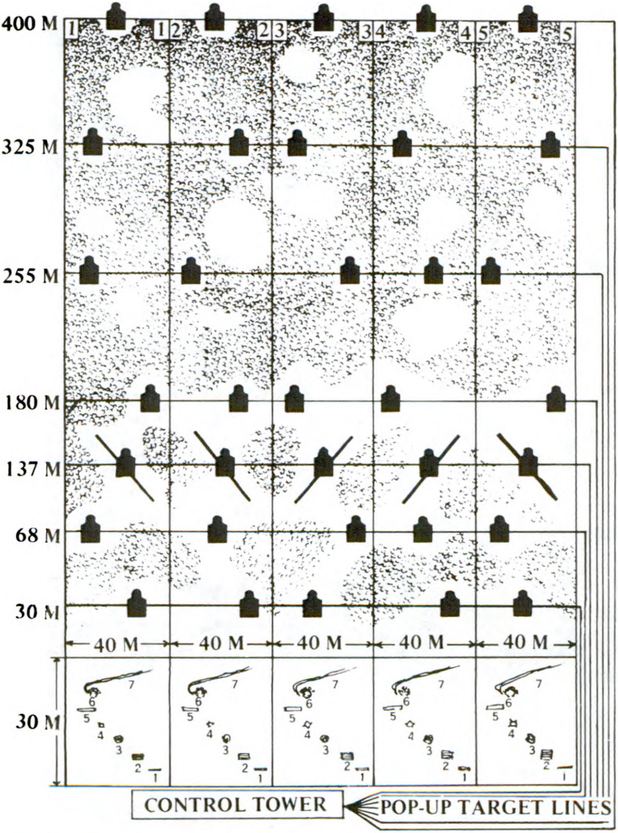


Figure F-1.--Typical Field Marksmanship Course.

FIELD RANGE SCORECARD				
NAME				RANK
ORGANIZATION				SERVICE NO.
DATE	RANGE	RELAY	LANE	U. S. MARINE CORPS INDIVIDUAL FIELD RANGE COURSE

POSITION NO.	POSITIONS	STAGE	TARGET RANGE(S)	TARGETS ENGAGED	EXPOSURE TIME SEC.	1ST TARGET HIT	2D TARGET HIT	AMMUNITION EXPENDED	TOTAL HITS PER STAGE
1	BARRICADE	1	BETWEEN 68 AND 255 METERS	SINGLE	15				
		2		MULTIPLE	30				
2	ROOF	1	137 M	SINGLE	15				
		2	SAME AS POS. 1	MULTIPLE	30				
3	RUBBLE PILE	1	325 M	SINGLE	30				
		2	SAME AS POS. 1	MULTIPLE	30				
4	STUMP	1	180 M	SINGLE	15				
		2	SAME AS POS. 1	MULTIPLE	30				
5	LOG	1	225 M	SINGLE	15				
		2	SAME AS POS. 1	MULTIPLE	30				
6	FOXHOLE	1	400 METERS	SINGLE	30				
7	ASSAULT	1	30 METERS	SINGLE	3				

SCORER'S NAME	TOTAL AMMUNITION EXPENDED	
RANGE OFFICER SIGNATURE	TOTAL HITS	
SHOOTER'S SIGNATURE	CLASSIFICATION (CHECK ONE) →	SATISFACTORY ☐ UNSATISFACTORY ☐

Figure F-2.--Field Range Scorecard.

d. Ammunition.--Each shooter is issued 68 rounds of ammunition, and he loads this ammunition equally into four magazines.

e. Immediate Action.--The rifleman is required to apply immediate action to clear all weapon malfunctions. Only in cases of a disabled weapon or equipment should an alibi be granted.

f. Stages of Fire.--There are two stages of fire in positions 1 through 5, and one stage of fire in positions 6 and 7 (see fig. F-2).

(1) During stage one of each position, a single target is engaged.

(2) During stage two, a combination of two targets located at different ranges is engaged.

(3) The sequence of ranges outlined on the field range scorecard are examples. When establishing sequence cards, the targets may be any sequence of targets from the 30-meter through the 400-meter targets; however, in position number 7 (assault) the range should not exceed 30 meters.

g. Exposure Time of Targets.--Single targets (stage one) 255 meters or less are exposed for 15 seconds except for the 30-meter target which is exposed for 3 seconds. All multiple targets (stage two) plus single targets beyond 255 meters are exposed for a period of 30 seconds.

h. Rounds Expended Per Target.--A maximum of four rounds are fired while engaging single targets, and eight rounds while engaging target combinations.

i. Scoring Procedure.--The scoring procedure used is "HITS COUNT." Any single hit on a silhouette will cause it to fall and constitute a kill, precluding additional firing. Since 17 targets are engaged, a total of 17 points can be obtained across the course.

j. Classification of Shooters.--As shown on the scorecard, shooters are classified satisfactory or unsatisfactory. Commanders should establish a goal involving percentage of hits per number of rounds fired, prior to beginning of this type of training. The total marksmanship knowledge of the Marines involved

will become more apparent to the commander and additional training can be incorporated to correct the deficiencies observed.

3. RANGE OPERATING PERSONNEL

The following range personnel are required to conduct firing:

a. Range Officer.--Responsible for the conduct of firing and enforcement of safety regulations.

b. Noncommissioned Officer in Charge.--Supervises range personnel. Coordinates movement of shooters between ready area, firing area, etc.

c. Target Control Operator.--Issues fire commands and raises and lowers targets according to the sequence and time prescribed.

d. One Scorer Per Lane.--Records hits and amount of ammunition expended. (Coaches may be assigned this duty.)

e. Target Device Repairman.--Performs on-the-spot repairs of target devices when minor malfunctions occur.

f. Ordnance Small Arms Repairman.--Provides technical assistance in repairing rifles.

g. Ammunition Detail.--Responsible for the issue and accounting of ammunition.

h. Medical Personnel.--Provide medical support where required.

4. RANGE SAFETY

See appendix A.

5. FIELD RANGE SCORECARD

When scores are desired, a scorecard as shown in figure 113 may be used.

6. FIRE COMMANDS

Simple standardized fire commands are essential to avoid confusion and misunderstandings on the field firing range. A type fire command which may be used is as follows:

(Relay No.) RELAY TAKE YOUR POSITION ON THE LINE.
THE FIRING LINE IS NO LONGER CLEAR.
*LOCK, ONE MAGAZINE LOAD.
READY ON THE RIGHT.
READY ON THE LEFT.
THE FIRING LINE IS READY. (The line is NOT ready.)
WATCH YOUR LANES.
CEASE FIRE.
**ARE THERE ANY ALIBIS?
**ALIBI SHOOTERS, WATCH YOUR LANES.
**CEASE FIRE.
CLEAR ALL WEAPONS.
CLEAR ON THE RIGHT?
CLEAR ON THE LEFT?
THE FIRING LINE IS CLEAR. (The firing line is NOT clear.)
SHOOTERS AND SUPERVISORY PERSONNEL MOVE FORWARD TO THE NEXT POSITION GUIDE CENTER.

*Reloading will be from the belt.
**Commands given only if a coach/scorer indicates his shooter has an authorized alibi.

7. FIELD RANGE COURSE (MODIFIED)

a. This course develops individual marksmanship skill by requiring the rifleman to:

(1) Distribute fire.
(2) Engage targets at various ranges.
(3) Apply battlesights.
(4) Apply sight adjustments.
(5) Place accurate fire on targets within a limited time period.

b. Because this course requires minimum application of combat marksmanship skills, it should be conducted only if the range facilities for the field range course are not available.

c. This course is designed to be fired on the same range facilities established for known distance qualification/requalification firing. A range facility with a 50-target capacity can fire 25 men in approximately 40 minutes.

d. Two simple modifications are required; they are:

(1) Targets.--This modification is accomplished by pasting the "E" and "F" silhouettes on the "A" target in the following manner: the "E" silhouette is centered with the top of the silhouette even with the top of the three ring; the "F" silhouette is centered with the

top of the silhouette even with the top of the four ring.

(2) Sandbags.--Two sandbags at each odd or even firing point on the 274-meter and 457-meter (300- and 500-yard) lines for the prone supported positions.

8. COURSE OF FIRE

The course of fire is illustrated in figure 114.

9. CONDUCT OF FIRE

The recommended procedure to fire the course is as follows:

RANGE (METERS)	TARGET(S)	ROUNDS	MAGAZINES	POSITION	SLING	TIME
183 (200 YDS)	"E"	10	1	STANDING	HASTY	60 SEC
183 (200 YDS)	"F"	10	2	SITTING FROM STANDING	HASTY	80 SEC
183 (200 YDS)	"E"	10	2	KNEELING FROM STANDING	HASTY	90 SEC
274 (300 YDS)	"E"	10	2	SITTING FROM STANDING	HASTY	60 SEC
274 (300 YDS)	"F"	10	2	PRONE SUPPORTED FROM STANDING	HASTY	60 SEC
457 (500 YDS)	"E"	10	1	PRONE SUPPORTED FROM STANDING	HASTY	2 MIN

NOTE: FIRE DISTRIBUTION IS FIVE ROUNDS AT EACH TARGET.

Figure F-3.--Course of Fire.

a. Sequence of Fire.--The sequence of fire is:

(1) 183 meters (200 yards).
(2) 274 meters (300 yards).
(3) 460 meters (500 yards).

b. Target and Firing Point Assignment.--Each shooter is assigned one firing point and two adjacent targets.

c. Sight Settings.--Battlesights are used for the 183- and 274-meter stages of fire. The 460-meter stage is fired by elevating the rear sight to the "L" aperture.

d. Alibis.--Only in cases of a disabled weapon or equipment should an alibi be allowed.

e. Fire Distribution.--In all stages of fire, the distribution should be five rounds at each silhouette.

f. Reloading.--Changing of magazines and release of the bolt are essential elements of training; therefore, the shooter is required to reload his rifle from the belt. In stages of fire that require the use of two magazines, each is loaded with five rounds.

g. Target Placement.--After the "E" or "F" silhouette is pasted over the "A" target, the "E" silhouette should be placed in the back carriage and the "F" silhouette in the front carriage.

h. Marking Targets.--Correct procedures are to mark the targets as follows:

(1) Targets are not pulled, marked, or scored until each stage of fire is completed by all shooters on each relay.

(2) To mark targets, one spotter is placed in each shot hole on the silhouette. Each hit is signaled by placing the disk in the upper right-hand corner of the target frame as the target puller faces the target. The red disk is used at all stages of fire.

i. Scoring Procedure.--For scoring procedures, see fig. F-4.

j. Classification of Shooters.--Commanders should establish a goal involving percentage of hits per number of rounds fired, prior to beginning of this type of training. The total marksmanship knowledge of the Marines involved will become more apparent to the commander and additional training can be incorporated to correct the deficiencies observed.

10. RANGE OPERATING PERSONNEL

The following personnel are required to conduct firing:

a. Range Officer.--Responsible for the conduct of firing and enforcing safety regulations.

b. Line Noncommissioned Officer.--Supervises range personnel, coordinates shooters, and issues fire commands.

c. Block Noncommissioned Officers.--A minimum of one block NCO for each 20 firing

FIELD RANGE COURSE (MODIFIED) SCORECARD							
NAME						RANK	
ORGANIZATION						SERVICE NO.	
DATE	RANGE	RELAY	FIRING POINT	TARGET(S)	U.S. MARINE CORPS FIELD RANGE COURSE (MODIFIED) SCORE SHEET		

STAGE	* SCORING DATA	HITS 1ST	HITS 2D	HITS TOTAL	BONUS	STAGE TOTAL	SHOOTER'S INITIALS
183 M (200 YDS) STANDING	2 POINTS PER HIT 10 POINT BONUS IF BOTH TARGETS HAVE THREE OR MORE HITS EACH						
183 M (200 YDS) STANDING TO SITTING	SAME AS ABOVE						
183 M (200 YDS) STANDING TO KNEELING	SAME AS ABOVE						
274 M (300 YDS) STANDING TO SITTING	3 POINTS PER HIT 10 POINT BONUS IF BOTH TARGETS HAVE THREE OR MORE HITS EACH						
274 M (300 YDS) STANDING TO PRONE SUPPORTED	SAME AS ABOVE						
457 M (500 YDS) STANDING TO PRONE SUPPORTED	4 POINTS PER HIT 10 POINT BONUS IF BOTH TARGETS HAVE THREE OR MORE HITS EACH						
SCORER'S NAME					TOTAL SCORE		
RANGE OFFICER SIGNATURE		CLASSIFICATION			SATISFACTORY ☐ UNSATISFACTORY ☐	CHECK ONE	

* Only hits on the silhouette will be scored.

Figure F-4.--Modified Field Range Course Scorecard.

points. They assist the line NCO in his duties and supervise the coaches.

d. Coaches.--A minimum of one coach for

each two shooters on the firing line to instruct and enforce safety regulations.

e. Scorers.--One for each firing point being used to record scores. (Coaches may be assigned this duty.)

f. Pit Noncommissioned Officer.--Issues the necessary commands related to operation of the pits and enforces safety precautions.

g. Telephone Operators.--As required to operate the range.

h. Ammunition Detail.--Responsible for issue and recovery of ammunition.

i. Medical Personnel.--Provide medical support when required.

11. RANGE SAFETY

See appendix A.

12. FIELD RANGE COURSE (MODIFIED) SCORECARD

When scores are desired, a scorecard as shown in figure 115 may be used.

13. FIRE COMMANDS

Simple standardized fire commands are essential to avoid misunderstandings. The following fire commands should be used when firing the field range course (modified):

(Relay No.) RELAY TAKE YOUR POSITION ON THE LINE.

*LOCK, ONE MAGAZINE LOAD.
IS THE LINE READY?
THE LINE IS READY. (The line is NOT ready.)
READY ON THE RIGHT.
READY ON THE LEFT.
READY ON THE FIRING LINE.
CEASE FIRE.
**ARE THERE ANY ALIBIS?
**ALIBI SHOOTERS, WATCH YOUR TARGETS.
**CEASE FIRE.
CLEAR ALL WEAPONS.
CLEAR ON THE RIGHT.
CLEAR ON THE LEFT.
THE FIRING LINE IS CLEAR. (The firing line is NOT clear.)
SHOOTERS AND COACHES, WATCH YOUR TARGETS. THEY ARE COMING UP FOR SCORING.
REPEAT ABOVE PROCEDURE UNTIL ALL RELAYS HAVE COMPLETED FIRING.

*The 2d magazine will be reloaded from the belt.
**Commands given only if a coach/scorer indicates his shooter has an authorized alibi.

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